

168049

**Allied Paper, Inc./Portage Creek/
Kalamazoo River Superfund Site
Kalamazoo, Michigan**

**Final Technical Memorandum 14
Biota Investigation**

**Appendix E
Data Quality Review Reports
Volume III**

January 2002

*Technical
Memorandum*

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# 39563

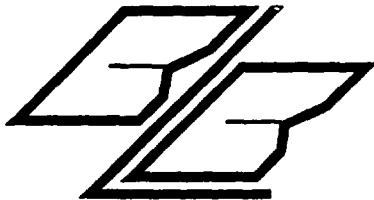
PCB, PESTICIDE AND
MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 39563 for the biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and qualified sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/Hg	%lipid
K40134F	215477	bass	fillet	Lake Allegan	x	x
K40134R	215478	bass	carcass	Lake Allegan		x
K40139F	215479	bass	fillet	Lake Allegan	x	x
K40139R	215480	bass	carcass	Below Allegan Dam		x
K40159F	215494	bass	fillet	Below Allegan Dam	x	x
K40159R	215495	bass	carcass	Below Allegan Dam		x
K40160F	215496	bass	fillet	Below Allegan Dam	x	x
K40160R	215497	bass	carcass	Below Allegan Dam		x
K40161F	215498	bass	fillet	Below Allegan Dam	x	x
K40161R	215499	bass	carcass	Below Allegan Dam		x
K40162F	215500	bass	fillet	Below Allegan Dam	X	x
K40162R	215501	bass	carcass	Below Allegan Dam		x
K40163F	215502	bass	fillet	Below Allegan Dam	x	x
K40163R	215503	bass	carcass	Below Allegan Dam		x
K40164F	215504	bass	fillet	Below Allegan Dam	x	x
K40164R	215505	bass	carcass	Below Allegan Dam		x
K40165F	215506	bass	fillet	Below Allegan Dam	x	x
K40165R	215507	bass	carcass	Below Allegan Dam		x
K40166F	215508	bass	fillet	Below Allegan Dam	x	x
K40166R	215509	bass	carcass	Below Allegan Dam		x
K40171F	215523	bass	fillet	Below Allegan Dam	x	x
K40171R	215524	bass	carcass	Below Allegan Dam		x
K40172F	215525	bass	fillet	Below Allegan Dam	x	x
K40172R	215526	bass	carcass	Below Allegan Dam		x
K40173F	215534	bass	fillet	Below Allegan Dam	x	x
K40173R	215528	bass	carcass	Below Allegan Dam		x
K40190F*	215487	bass	fillet	Near Saugatuck	x	x
K40190R	215535	bass	carcass	Near Saugatuck		x

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/Hg	%lipid
K40191F	215536	bass	fillet	Near Saugatuck	x	x
K40191R	215537	bass	carcass	Near Saugatuck		x

* MS/MSD/DUP performed on sample

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

There is no specified holding time from collection to extraction for PCB analysis of biota samples. The specified holding time from extraction to analysis is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross contamination of samples during field operations.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in samples K40134F and K40139F. All data for these samples have been qualified as estimated. Samples K40190FMS and K40190FMSD had recovery of one surrogate below acceptable control limits. No qualifiers were added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike recoveries and relative percent differences (RPD) between recoveries were within acceptable control limits. All matrix spike blank recoveries were also within specified control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 8 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Instrument Blanks	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u> </u>	<u> </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40134F	OK for all samples	↓ (39)	↓ (56)	↓ (39)	↓ (53)
K40139F		↓ (39)	↓ (57)	↓ (39)	↓ (56)
K40159F					
K40160F					
K40161F					
K40162F					
K40163F					
K40164F					
K40165F					
K40166F					
K40171F					
K40172F					
K40173F					
K40190F					
K40190FMS		↓ (57)		↓ (57)	
K40190FMSD		↓ (53)		↓ (53)	
K40191F					

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 ↑ Recovery high
 ↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:	4/30/94 0543	5/4	5/4	5/4	5/4	5/4	5/4
Time:	to 5/1/94 0108	0434	0509	1200	1234	1925	1959
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.2 / 4.4				3.5		
Aroclor 1221	5.1 / 6.9						
Aroclor 1232	4.2 / 3.1						
Aroclor 1242	3.1 / 3.4						3.5
Aroclor 1248	3.4 / 3.0	3.5		4.0		4.5	
Aroclor 1254	3.1 / 3.6						
Aroclor 1260	3.8 / 3.4		8.0				
Tetrachloro-m-xylene	5.2 / 6.4						
Decachlorobiphenyl	7.9 / 8.1						
Affected Samples:							

PCB Calibration Summary - Page 2

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:		5/5	5/5	5/5	5/5	5/5	5/5
Time:		0250	0324	1014	1048	2309	2343
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016							6.0
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		2.0		1.0		0.5	
Aroclor 1254			5.0				
Aroclor 1260					1.0		
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

PCB Calibration Summary - Page 3

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:		5/9	5/9	5/10	5/10		
Time:		1255	1330	0423	0457		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016					0.5		
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		3.0		5.0			
Aroclor 1254							
Aroclor 1260			3.0				
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40134F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215477

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 5.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.64	J
11104-28-2	Aroclor-1221	0.25	UJ
11141-16-5	Aroclor-1232	0.25	UJ
53469-21-9	Aroclor-1242	0.25	UJ
12672-29-6	Aroclor-1248	0.25	UJ
11097-69-1	Aroclor-1254	1.5	J
11096-82-5	Aroclor-1260	0.25	UJ

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40139F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215479

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 5.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	1.7	J
11104-28-2	Aroclor-1221	0.25	U J
11141-16-5	Aroclor-1232	0.25	U J
53469-21-9	Aroclor-1242	0.25	U J
12672-29-6	Aroclor-1248	0.25	U J
11097-69-1	Aroclor-1254	1.3	J
11096-82-5	Aroclor-1260	0.25	U J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40159F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215494

Phase Weight: 10.0 (g)

Date Received: 09/23/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 5.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	1.0	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.25	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40160F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215496

Phase Weight: 10.0 (g)

Date Received: 09/23/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 2.0

Date Analyzed: 05/05/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.36	
11097-69-1	Aroclor-1254	0.69	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40161F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215498

Phase Weight: 10.0 (g)

Date Received: 09/23/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 5.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.83	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.4	
11096-82-5	Aroclor-1260	0.25	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40162F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215500

Phase Weight: 10.0 (g)

Date Received: 09/23/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 5.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.55	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.4	
11096-82-5	Aroclor-1260	0.25	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40163F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215502

Phase Weight: 10.0 (g)

Date Received: 09/23/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 2.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.46	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40164F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215504

Phase Weight: 10.0 (g)

Date Received: 09/23/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 5.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.62	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.8	
11096-82-5	Aroclor-1260	0.25	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40165F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215506

Phase Weight: 10.0 (g)

Date Received: 09/23/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 2.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.70	
11097-69-1	Aroclor-1254	0.77	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40166F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215508

Phase Weight: 10.0 (g)

Date Received: 09/23/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 2.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.87	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.85	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40171F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215523

Phase Weight: 10.0 (g)

Date Received: 10/07/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 2.0

Date Analyzed: 05/10/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.41	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.089	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40172F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215525

Phase Weight: 10.0 (g)

Date Received: 10/07/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 2.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	1.1	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40173F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215534

Phase Weight: 10.0 (g)

Date Received: 10/07/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 2.0

Date Analyzed: 05/10/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.91	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40190F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215487

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 1.0

Date Analyzed: 05/04/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.21	
11097-69-1	Aroclor-1254	0.45	
11096-82-5	Aroclor-1260	0.17	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40191F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Phase Type: BIOTA

Lab Sample ID: 215536

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/04/94

Dilution Factor: 1.0

Date Analyzed: 05/05/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.23	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.58	
11096-82-5	Aroclor-1260	0.050	U

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were low for both surrogates in sample K40134F. All data for this sample have been qualified as estimated based on the deviation. Sample K40139F had one surrogate recovery below acceptable control limits. No qualifiers have been added to this sample based on surrogate recovery. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40134F	Aldrin	75.8%
	gamma-Chlordane	125.0%
	4,4'-DDE	27.4%
	cis-Nonachlor	30.8%
	4,4'-DDT	584.6%
K40139F	Aldrin	59.2%
	gamma-Chlordane	113.3%
	Dieldrin	60.0%
K40159F	Aldrin	66.7%
	gamma-Chlordane	107.1%
	Dieldrin	41.2%
	cis-Nonachlor	45.5%
K40160F	Aldrin	130.4%
	gamma-Chlordane	110.0%
	4,4'-DDE	27.3%
	cis-Nonachlor	56.6%
K40161F	Aldrin	90.0%
	gamma-Chlordane	87.5%
	Dieldrin	115.4%
	cis-Nonachlor	58.3%
K40162F	Aldrin	122.2%
	gamma-Chlordane	91.7%
	Dieldrin	108.3%
	cis-Nonachlor	60.0%

K40163F	Aldrin	100.0%
	gamma-Chlordane	90.9%
	4,4'-DDE	26.8%
	cis-Nonachlor	62.5%
K40164F	Aldrin	132.4%
	gamma-Chlordane	88.9%
	cis-Nonachlor	71.4%
K40165F	Aldrin	125.7%
	gamma-Chlordane	75.0%
	4,4'-DDE	27.1%
	Dieldrin	115.4%
P40166F	Aldrin	103.6%
	gamma-Chlordane	81.8%
	4,4'-DDE	26.4%
K40171F	Aldrin	100.0%
	gamma-Chlordane	116.7%
	cis-Nonachlor	74.4%
K40172F	Aldrin	83.3%
	gamma-Chlordane	105.9%
	Dieldrin	130.8%
	cis-Nonachlor	53.8%
K40173F	Aldrin	86.7%
	gamma-Chlordane	117.6%
	Dieldrin	106.7%
	cis-Nonachlor	58.3%
K40190F	Aldrin	93.3%
	gamma-Chlordane	133.3%
	cis-Nonachlor	74.6%
K40191F	Aldrin	93.8%
	gamma-Chlordane	124.1%
	4,4'-DDE	25.7%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries for Aldrin were high in both the matrix spike and matrix spike duplicate samples. The elevated recoveries were most likely due to positive interference from PCBs present in the samples. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers were added to the samples based on matrix spike performance.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are the surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
Were the method blanks reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 2 </u> out of <u> 8 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
<u>Blanks</u>			
Is the method blank summary form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	X		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
Is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	X		
Is Form VII-2 present and complete for each mid-point standard analyzed?	X		
Are RPD values for all compounds < 25%?	X		
<u>Analytical Sequence Check</u>			
Is Form VIII present and complete for each column and each period of analyses?	X		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u> </u>	<u> </u>
Are all samples listed on the form?	<u>X</u>	<u> </u>	<u> </u>
If GPC cleanup was performed, is Form IX-2 present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u> </u>	<u> </u>
GPC calibration (80-110%)	<u> </u>	<u> </u>	<u>X</u>
<u>Pesticide/PBB Identification</u>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u> </u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u> </u>	<u>X</u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

Pesticide/PBB Qualifier Summary
Holding Time and Surrogates

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40134F	OK for all samples	↓ (53)	↓ (52)	↓ (53)	↓ (51)
K40139F			↓ (59)		↓ (57)
K40159F					
K40160F					
K40161F					
K40162F					
K40163F					
K40164F					
K40165F					
K40166F					
K40171F					
K40172F					
K40173F					
K40190F					
K40190FMS					
K40190FMSD					
K40191F					

Surrogates:

TCX Tetrachloro-m-xylene

DCB Decachlorobiphenyl

Qualifiers:

D Surrogate diluted out

↑ Recovery high

↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: HP2404
 Column: RTX-5

Date:	4/26/94	5/1	5/1	5/2	5/2		
Time:	20:30	08:27	17:23	01:43	14:08		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404
 Column: RTX-35

Date:	4/26/94	5/1	5/1	5/2	5/2		
Time:	20:30	08:27	17:23	01:43	14:08		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404

Column: RTX-5

Date:	5/5/94	5/6					
Time:	16:20	06:37					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404
Column: RTX-35

Date:	5/5/94	5/6					
Time:	16:20	06:37					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Corrected Sample Analysis Data Sheets

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40134F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39563

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215477
Date Received: 09/18/93
Date Extracted: 03/31/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.033	JN
1024-57-3	Heptachlor Epoxide	0.030	J
5103-74-2	gamma-Chlordane	0.012	
5103-71-9	alpha-Chlordane	0.0050	UJ
39765-80-5	trans-Nonachlor	0.0050	UJ
72-55-9	4,4'-DDE	0.062	J
60-57-1	Dieldrin	0.010	UJ
72-54-8	4,4'-DDD	0.016	J
5103-73-1	cis-Nonachlor	0.013	J
50-29-3	4,4'-DDT	0.013	
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	UJ

R

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40139F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39563

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215479
 Date Received: 09/18/93
 Date Extracted: 03/31/94
 Date Analyzed: 05/01/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.049	JN
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.032	
5103-71-9	alpha-Chlordane	0.0053	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.067	
60-57-1	Dieldrin	0.015	JN
72-54-8	4,4'-DDD	0.022	
5103-73-1	cis-Nonachlor	0.013	
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40159F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39563

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215494
 Date Received: 09/23/94
 Date Extracted: 04/04/94
 Date Analyzed: 05/01/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.042	JN
1024-57-3	Heptachlor Epoxide	0.043	
5103-74-2	gamma-Chlordane	0.014	
5103-71-9	alpha-Chlordane	0.0070	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.083	
60-57-1	Dieldrin	0.017	J
72-54-8	4,4'-DDD	0.022	
5103-73-1	cis-Nonachlor	0.011	J
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40160F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39563

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215496
Date Received: 09/23/94
Date Extracted: 04/04/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.023	
1024-57-3	Heptachlor Epoxide	0.028	
5103-74-2	gamma-Chlordane	0.010	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.055	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0083	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40161F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39563

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215498
Date Received: 09/23/94
Date Extracted: 04/04/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.040	JN
1024-57-3	Heptachlor Epoxide	0.046	
5103-74-2	gamma-Chlordane	0.016	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.087	
60-57-1	Dieldrin	0.013	
72-54-8	4,4'-DDD	0.019	
5103-73-1	cis-Nonachlor	0.012	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

K40162F

SDG: 39563

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215500
 Date Received: 09/23/94
 Date Extracted: 04/04/94
 Date Analyzed: 05/01/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.027	
1024-57-3	Heptachlor Epoxide	0.030	
5103-74-2	gamma-Chlordane	0.012	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.070	
60-57-1	Dieldrin	0.012	
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.010	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40163F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39563

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215502
 Date Received: 09/23/94
 Date Extracted: 04/04/94
 Date Analyzed: 05/01/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.027	
1024-57-3	Heptachlor Epoxide	0.028	
5103-74-2	gamma-Chlordane	0.011	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.056	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.012	
5103-73-1	cis-Nonachlor	0.0080	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40164F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39563

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215504
Date Received: 09/23/94
Date Extracted: 04/04/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.037	
1024-57-3	Heptachlor Epoxide	0.052	
5103-74-2	gamma-Chlordane	0.018	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.12	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.016	
5103-73-1	cis-Nonachlor	0.014	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40165F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39563

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215506
Date Received: 09/23/94
Date Extracted: 04/04/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.035	
1024-57-3	Heptachlor Epoxide	0.043	
5103-74-2	gamma-Chlordane	0.016	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.070	J
60-57-1	Dieldrin	0.013	
72-54-8	4,4'-DDD	0.011	
5103-73-1	cis-Nonachlor	0.015	
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40166F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39563

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215508
Date Received: 09/23/94
Date Extracted: 04/04/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
300-00-2	Aldrin	0.028	
1024-57-3	Heptachlor Epoxide	0.030	
5103-74-2	gamma-Chlordane	0.011	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.053	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.012	
50-29-3	4,4'-DDT	0.010	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40171F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39563

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215523
Date Received: 10/07/94
Date Extracted: 04/04/94
Date Analyzed: 05/01/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.028	
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.012	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.071	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	
5103-73-1	cis-Nonachlor	0.0086	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40172F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39563

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215525
 Date Received: 10/07/94
 Date Extracted: 04/04/94
 Date Analyzed: 05/01/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.042	JN
1024-57-3	Heptachlor Epoxide	0.046	
5103-74-2	gamma-Chlordane	0.017	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.082	
60-57-1	Dieldrin	0.013	
72-54-8	4,4'-DDD	0.016	
5103-73-1	cis-Nonachlor	0.012	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40173F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39563

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215534
 Date Received: 10/07/94
 Date Extracted: 04/04/94
 Date Analyzed: 05/01/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.045	JN
1024-57-3	Heptachlor Epoxide	0.050	
5103-74-2	gamma-Chlordane	0.017	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.086	
60-57-1	Dieldrin	0.015	
72-54-8	4,4'-DDD	0.018	
5103-73-1	cis-Nonachlor	0.012	JN
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40190F

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 39563Lab Sample ID: 215487Date Received: 10/08/94Date Extracted: 04/04/94Date Analyzed: 05/01/94Sulfur Clean-up: N

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.015	
1024-57-3	Heptachlor Epoxide	0.013	
5103-74-2	gamma-Chlordane	0.0060	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.067	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0063	JW
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40191F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39563

Lab Sample ID: 215536

Date Received: 10/08/94

Date Extracted: 04/04/94

Date Analyzed: 05/02/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.016	
1024-57-3	Heptachlor Epoxide	0.016	
5103-74-2	gamma-Chlordane	0.0058	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.035	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0071	
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u> </u>	<u> </u>
Sample No.?	<u>X</u>	<u> </u>	<u> </u>
SDG No.?	<u>X</u>	<u> </u>	<u> </u>
Correct units?	<u>X</u>	<u> </u>	<u> </u>
Matrix?	<u>X</u>	<u> </u>	<u> </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u> </u>	<u> </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u> </u>	<u> </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u> </u>	<u> </u>
Is the distillation log for cyanides present?	<u> </u>	<u> </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u> </u>	<u> </u>
Are the measurement read out records present for:			
ICP	<u> </u>	<u> </u>	<u>X</u>
Flame AA	<u> </u>	<u> </u>	<u>X</u>
Furnace AA	<u> </u>	<u> </u>	<u>X</u>
Mercury	<u>X</u>	<u> </u>	<u> </u>
Cyanides	<u> </u>	<u> </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u> </u>	<u> </u>
Is the data properly labeled?	<u>X</u>	<u> </u>	<u> </u>
<u>Holding Times</u>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u> </u>	<u> </u>

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Form I (Final Data)			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Calibration</u>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form II A (Initial and Continuing Calibration Verification)</u>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)?			X
<u>Form III (Initial and Continuing Calibration Blanks)</u>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<u>Form III (Preparation Blank)</u>			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form IV (ICP Interference Check Sample)</u>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ($\pm 20\%$)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form VI (Lab Duplicates)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	<u>X</u>	<u> </u>	<u> </u>
Was field blank used for duplicate analysis?	<u> </u>	<u>X</u>	<u> </u>
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	<u>X</u>	<u> </u>	<u> </u>
If no, are all results outside the control limits flagged with an * on Form I's and VI?	<u> </u>	<u> </u>	<u>X</u>
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?	<u> </u>	<u>X</u>	<u> </u>
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?	<u> </u>	<u> </u>	<u>X</u>
<u>Form VII (Laboratory Control Sample)</u>			
Was one LCS prepared and analyzed for:			
each SDG?	<u>X</u>	<u> </u>	<u> </u>
each batch samples digested/distilled?	<u>X</u>	<u> </u>	<u> </u>
Is LLCS "Found" value higher than the control limits on Form VII?	<u> </u>	<u>X</u>	<u> </u>
Is LCS "Found" lower than the control limits on Form VII?	<u> </u>	<u>X</u>	<u> </u>
<u>Form IX (ICP Serial Dilution)</u>			
Was Serial Dilution analysis performed for:			
each SDG?	<u> </u>	<u> </u>	<u>X</u>
each matrix type?	<u> </u>	<u> </u>	<u>X</u>
Was field blank(s) used for Serial Dilution Analysis?	<u> </u>	<u> </u>	<u>X</u>
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration of Form IX is equal to 50 times IDL or greater.	<u> </u>	<u> </u>	<u>X</u>
Are any % difference values:			
> 10%?	<u> </u>	<u> </u>	<u>X</u>
\geq 100%?	<u> </u>	<u> </u>	<u>X</u>
<u>Furnace Atomic Absorbtion (AA) QC Analysis</u>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?	<u> </u>	<u> </u>	<u>X</u>

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	_____	_____	X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	_____	_____	X
Is analytical spike recovery outside the control limits (85-115%) for any sample?	_____	_____	X
<u>Form VIII (Method of Standard Addition Results)</u>			
Present?	_____	X	_____
If no, is any Form I result coded with "S" or a "+"?	_____	X	_____
Is coefficient of correlation for MSA less than 0.990 for any sample?	_____	_____	X
Was MSA required for any sample but not performed?	_____	X	_____
Is coefficient of correlation for MSA less than 0.995?	_____	_____	X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	_____	_____	X
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	_____	_____	X
<u>Field Blank</u>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	_____	_____	X
If no, was field blank value already rejected due to other QC criteria?	_____	_____	X
<u>Form X, XI, XII (Verification of Instrumental Parameters)</u>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	X	_____	_____
ICP Interelement Correlation Factors (annually)?	_____	_____	X
ICP Linear Ranges (quarterly)?	_____	_____	X
<u>Form X (Instrument Detection Limits)</u>			
Are IDLs present for:			
all the analytes?	X	_____	_____
all the instruments used?	X	_____	_____

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u> </u>	<u> X </u>	<u> </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher linear range of ICP.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u> </u>	<u> X </u>	<u> </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u> </u>	<u> </u>	<u> X </u>

Corrected Sample Analysis Data Sheets

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40134F

Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39563 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 215477

Level (low/med): LOW _____ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40139F

b Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39563

Matrix (soil/water): FISH Lab Sample ID: 215479

Level (low/med): LOW Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40159F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39563

Matrix (soil/water): FISH Lab Sample ID: 215494

Level (low/med): LOW Date Received: 09/23/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40160F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39563

Matrix (soil/water): FISH

Lab Sample ID: 215496

Level (low/med): LOW

Date Received: 09/23/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40161F

Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39563 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 215498

Level (low/med): LOW _____ Date Received: 09/23/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.16		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40162F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39563

Matrix (soil/water): FISH Lab Sample ID: 215500

Level (low/med): LOW Date Received: 09/23/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09		J N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40163F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39563

Matrix (soil/water): FISH

Lab Sample ID: 215502

Level (low/med): LOW

Date Received: 09/23/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40164F

Name: AQUATEC Contract: 91082
Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39563
Matrix (soil/water): FISH Lab Sample ID: 215504
Level (low/med): LOW Date Received: 09/23/93
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:
Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40165F

o Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39563

Matrix (soil/water): FISH

Lab Sample ID: 215506

Level (low/med):

LOW

Date Received: 09/23/93

% Solids:

100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40166F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39563

Matrix (soil/water): FISH

Lab Sample ID: 215508

Level (low/med): LOW

Date Received: 09/23/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.07		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40171F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39563

Matrix (soil/water): FISH Lab Sample ID: 215523

Level (low/med): LOW Date Received: 10/07/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40172F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39563

Matrix (soil/water): FISH

Lab Sample ID: 215525

Level (low/med): LOW

Date Received: 10/07/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09		5 N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40173F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39563

Matrix (soil/water): FISH Lab Sample ID: 215534

Level (low/med): LOW Date Received: 10/07/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.11		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40190F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39563

Matrix (soil/water): FISH Lab Sample ID: 215487

Level (low/med): LOW Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40191F

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39563 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 215536

Level (low/med): LOW _____

Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	Fillet Weight	% Lipids	
				Fillet	Remaining Carcass
K40134	Small Mouth Bass	male	320g	2.37	5.62
K40139	Small Mouth Bass	male	171g	3.27	8.78
K40159	Small Mouth Bass	female	513g	2.65	10.6
K40160	Small Mouth Bass	female	283g	0.87	2.40
K40161	Small Mouth Bass	female	441g	1.59	4.10
K40162	Small Mouth Bass	male	274g	1.71	5.20
K40163	Small Mouth Bass	female	249g	0.93	4.80
K40164	Small Mouth Bass	male	212g	1.93	4.90
K40165	Small Mouth Bass	male	191g	2.68	5.60
K40166	Small Mouth Bass	female	183g	1.69	10.5
K40171	Small Mouth Bass	female	348g	1.19	4.88
K40172	Small Mouth Bass	female	305g	2.20	4.70
K40173	Small Mouth Bass	female	213g	2.00	6.80
K40190	Small Mouth Bass	male	92g	0.92	3.36
K40191	Small Mouth Bass	male	112g	1.11	6.43

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# 39566

PCB, PESTICIDE AND
MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 39566 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/Hg	%lipid
K40141W	197869	White Sucker	whole body	Lake Allegan	x	x
K40142W	197870	White Sucker	whole body	Lake Allegan	x	x
K40143W	197871	White Sucker	whole body	Lake Allegan	x	x
K40144W	197872	White Sucker	whole body	Lake Allegan	x	x
K40145W	197873	White Sucker	whole body	Lake Allegan	x	x
K40146W	197874	White Sucker	whole body	Lake Allegan	x	x
K40147W	197875	White Sucker	whole body	Lake Allegan	x	x
K40148W	197876	White Sucker	whole body	Lake Allegan	x	x
K40149W	197877	White Sucker	whole body	Lake Allegan	x	x
K40150W	197878	White Sucker	whole body	Lake Allegan	x	x
K40151W	197879	White Sucker	whole body	Lake Allegan	x	x
K40202W*	200182	White Sucker	whole body	Near Saugatuck	x	x
K40203W	200183	White Sucker	whole body	Near Saugatuck	x	x
K40204W	200184	White Sucker	whole body	Near Saugatuck	x	x
K40205W	200185	White Sucker	whole body	Near Saugatuck	x	x
K40206W	200186	White Sucker	whole body	Near Saugatuck	x	x
K40207W	200187	White Sucker	whole body	Near Saugatuck	x	x
K40208W	200188	White Sucker	whole body	Near Saugatuck	x	x
K40209W	200189	White Sucker	whole body	Near Saugatuck	x	x
K40210W	200190	White Sucker	whole body	Near Saugatuck	x	x

* MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike recoveries and relative percent differences (RPD) between recoveries were within acceptable control limits. All matrix spike blank recoveries were also within specified control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 8 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Instrument Blanks	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u> </u>	<u> </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40141W	OK for all samples	ok	ok	ok	ok
K40142W					
K40143W					
K40144W					
K40145W					
K40146W					
K40147W					
K40148W					
K40149W					
K40150W					
K40151W					
K40202W					
K40202WMS					
K40202WMSD					
K40203W					
K40204W					
K40205W					
K40206W					
K40207W					
K40208W					
K40209W					
K40210W					

TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

D Surrogates diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2087
 Column: RTX-35 / RTX-5

Date:	5/8/94 2109	5/12	5/12	5/13	5/13	5/13	5/13
Time:	to 5/9/94 1730	1728	1804	0115	0151	0903	0939
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	5.0 / 4.7				7.0		
Aroclor 1221	3.8 / 2.8						
Aroclor 1232	3.0 / 2.7						
Aroclor 1242	3.7 / 2.9						14.5
Aroclor 1248	3.6 / 3.1	7.0		14.5		14.5	
Aroclor 1254	9.3 / 8.9						
Aroclor 1260	3.0 / 3.0		2.0				
Tetrachloro-m-xylene	4.9 / 3.1						
Decachlorobiphenyl	8.1 / 11.8						
Affected Samples:							

PCB Calibration Summary - Page 2

Instrument: HP2087
 Column: RTX-35 / RTX-5

Date:	5/19/94 1800	5/20	5/20	5/20	5/20		
Time:	to 5/19/94 1254	0848	0922	2236	2310		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	3.9 / 4.3				11.5		
Aroclor 1221	4.6 / 5.5						
Aroclor 1232	2.9 / 3.2						
Aroclor 1242	3.6 / 3.3						
Aroclor 1248	3.1 / 3.0	3.0		2.5			
Aroclor 1254	3.0 / 3.0						
Aroclor 1260	3.2 / 2.3		4.0				
Tetrachloro-m-xylene	7.7 / 5.0						
Decachlorobiphenyl	7.2 / 8.8						
Affected Samples:							

PCB Calibration Summary - Page 3

Instrument: HP2087
 Column: RTX-35 / RTX-5

Date:	5/25/94 1240	5/26	5/26	5/26	5/26		
Time:	to 5/26/94 0735	1559	1632	2314	2348		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.7 / 4.1						
Aroclor 1221	5.3 / 4.5						
Aroclor 1232	3.0 / 2.8						
Aroclor 1242	3.3 / 2.6		0.0				
Aroclor 1248	3.7 / 3.4	1.0		14.5			
Aroclor 1254	5.3 / 4.5				14.5		
Aroclor 1260	3.5 / 3.5						
Tetrachloro-m-xylene	8.4 / 6.3						
Decachlorobiphenyl	6.0 / 10.1						
Affected Samples:							

PCB Calibration Summary - Page 4

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:	5/31/94 13:01	6/1	6/1	6/1	6/1	6/1	6/1
Time:	to 6/1/94 07:51	0857	0930	1643	1716	2143	2216
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	3.4 / 4.2	3.0					
Aroclor 1221	8.9 / 5.9						
Aroclor 1232	3.1 / 3.1						
Aroclor 1242	3.0 / 3.1				6.0		
Aroclor 1248	2.4 / 2.3		0.0	3.5		3.5	
Aroclor 1254	2.8 / 3.0						1.5
Aroclor 1260	2.7 / 2.8						
Tetrachloro-m-xylene	4.5 / 3.2						
Decachlorobiphenyl	6.5 / 6.9						
Affected Samples:							

PCB Calibration Summary - Page 5

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:		6/2	6/2	6/2	6/2		
Time:		0455	0529	0922	0955		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016					7.0		
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		4.5		4.5			
Aroclor 1254							
Aroclor 1260			2.5				
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40141W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197869

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.15	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.36	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40142W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197870

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.23	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.59	
11096-82-5	Aroclor-1260	0.10	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40143W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197871

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.60	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.70	
11096-82-5	Aroclor-1260	0.11	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40144W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197872

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.21	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.39	
11096-82-5	Aroclor-1260	0.062	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40145W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197873

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.15	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.31	
11096-82-5	Aroclor-1260	0.091	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40146W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197874

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.20	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.66	
11096-82-5	Aroclor-1260	0.056	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40147W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197875

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.53	
11096-82-5	Aroclor-1260	0.063	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40148W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197876

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 2.0

Date Analyzed: 05/20/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.1	
11097-69-1	Aroclor-1254	0.60	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40149W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197877

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.21	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.32	
11096-82-5	Aroclor-1260	0.072	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40150W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197878

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.18	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.34	
11096-82-5	Aroclor-1260	0.032	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40151W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 197879

Phase Weight: 10.0 (g)

Date Received: 09/18/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/13/94

Dilution Factor: 1.0

Date Analyzed: 05/13/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.13	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.34	
11096-82-5	Aroclor-1260	0.085	

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40202W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200182

Phase Weight: 3.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/23/94

Dilution Factor: 1.0

Date Analyzed: 05/26/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.17	U
11104-28-2	Aroclor-1221	0.17	U
11141-16-5	Aroclor-1232	0.17	U
53469-21-9	Aroclor-1242	0.81	
12672-29-6	Aroclor-1248	0.17	U
11097-69-1	Aroclor-1254	0.80	
11096-82-5	Aroclor-1260	0.17	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40203W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200183

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/24/94

Dilution Factor: 1.0

Date Analyzed: 06/01/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.53	
11097-69-1	Aroclor-1254	0.37	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40204W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200184

Phase Weight: 10.4 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/24/94

Dilution Factor: 1.0

Date Analyzed: 06/01/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.048	U
11104-28-2	Aroclor-1221	0.048	U
11141-16-5	Aroclor-1232	0.048	U
53469-21-9	Aroclor-1242	0.048	U
12672-29-6	Aroclor-1248	0.74	
11097-69-1	Aroclor-1254	0.37	
11096-82-5	Aroclor-1260	0.048	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40205W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200185

Phase Weight: 10.3 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/24/94

Dilution Factor: 2.0

Date Analyzed: 06/02/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.097	U
11104-28-2	Aroclor-1221	0.097	U
11141-16-5	Aroclor-1232	0.097	U
53469-21-9	Aroclor-1242	0.097	U
12672-29-6	Aroclor-1248	0.62	
11097-69-1	Aroclor-1254	0.33	
11096-82-5	Aroclor-1260	0.097	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40206W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200186

Phase Weight: 10.2 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/24/94

Dilution Factor: 1.0

Date Analyzed: 06/01/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.049	U
11104-28-2	Aroclor-1221	0.049	U
11141-16-5	Aroclor-1232	0.049	U
53469-21-9	Aroclor-1242	0.049	U
12672-29-6	Aroclor-1248	0.47	
11097-69-1	Aroclor-1254	0.44	
11096-82-5	Aroclor-1260	0.049	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40207W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200187

Phase Weight: 10.3 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/24/94

Dilution Factor: 1.0

Date Analyzed: 06/01/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.049	U
11104-28-2	Aroclor-1221	0.049	U
11141-16-5	Aroclor-1232	0.049	U
53469-21-9	Aroclor-1242	0.049	U
12672-29-6	Aroclor-1248	0.59	
11097-69-1	Aroclor-1254	0.46	
11096-82-5	Aroclor-1260	0.049	U

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40208W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200188

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/24/94

Dilution Factor: 2.0

Date Analyzed: 06/02/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.49	
11097-69-1	Aroclor-1254	0.29	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40209W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200189

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/24/94

Dilution Factor: 1.0

Date Analyzed: 06/01/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.62	
11097-69-1	Aroclor-1254	0.58	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40210W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39566

Phase Type: BIOTA

Lab Sample ID: 200190

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 05/24/94

Dilution Factor: 1.0

Date Analyzed: 06/01/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.53	
11097-69-1	Aroclor-1254	0.50	
11096-82-5	Aroclor-1260	0.050	U

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exceptions:

Instrument HP2404, RTX-5 - 5/14/94 00:50

2-Bromobiphenyl 30.2%

All data in the associated samples K40141W, K40142W, K40143W, K40144W, K40145W, K40146W, K40147W, K40148W, K40149W, K40150W and K40151W have been qualified as estimated.

2-Bromobiphenyl

25.5%

All data in the associated samples K40143W, K40144W, K40145W, K40146W, K40147W, K40148W, K40149W, K40150W and K40151W have been qualified as estimated.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40141W	Aldrin	80.0%
	4,4'-DDE	33.3%
	4,4'-DDT	324.2%
K40142W	Aldrin	100.0%
	Heptachlor Epoxide	52.9%
	gamma-Chlordane	145.3%
	4,4'-DDE	26.9%
K40143W	Aldrin	86.4%
	Heptachlor Epoxide	151.9%
	gamma-Chlordane	82.8%
K40144W	Aldrin	93.2%
	Heptachlor Epoxide	154.5%
	4,4'-DDE	33.3%
K40145W	Aldrin	70.5%
	Heptachlor Epoxide	56.6%
K40146W	Aldrin	90.9%
	Heptachlor Epoxide	333.3%
	gamma-Chordane	86.0%

K40147W	Aldrin	63.6%
	Heptachlor Epoxide	93.5%
	4,4-DDE	31.3%
K40148W	Aldrin	86.4%
	Heptachlor Epoxide	109.7%
K40149W	Aldrin	83.3%
	Heptachlor Epoxide	476.5%
	4,4'-DDE	26.3%
P40150W	Aldrin	69.2%
	Heptachlor Epoxide	220.0%
K40151W	Aldrin	77.1%
	Heptachlor Epoxide	763.6%
K40202W	Aldrin	34.4%
	Heptachlor Epoxide	3654.8%
	4,4'-DDE	31.3%
K40203W	Aldrin	79.2%
	gamma-Chlordane	156.6%
	4,4'-DDE	31.0%
K40204W	Aldrin	85.2%
	gamma-Chlordane	144.6%
K40205W	Aldrin	93.1%
	gamma-Chlordane	110.1%
K40206W	Aldrin	82.1%
	gamma-Chlordane	149.1%
K40207W	Aldrin	73.4%
	gamma-Chlordane	157.4%
	4,4'-DDE	34.8%
K40208W	Aldrin	78.0%
	gamma-Chlordane	146.7%
	4,4'-DDE	26.3%
K40209W	Aldrin	93.1%
	gamma-Chlordane	110.1%
K40210W	Aldrin	90.1%
	gamma-Chlordane	148.4%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries for Aldrin, Dieldrin and 4,4'-DDT were high in both the matrix spike and matrix spike duplicate samples. The elevated recoveries were most likely due to positive interference from PCBs present in the samples. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers have been added to the samples based on matrix spike performance.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are the surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u> </u>	<u> </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u> </u>	<u>X</u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
Were the method blanks reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>6</u> out of <u>8</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>0</u> out of <u>4</u>			
<u>Blanks</u>			
Is the method blank summary form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any trip/field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	<u>X</u>	<u> </u>	<u> </u>
performance evaluation mixtures (BCS)	<u>X</u>	<u> </u>	<u> </u>
Toxaphene multipoint calibration	<u>X</u>	<u> </u>	<u> </u>
Pesticide/PBB multipoint calibration	<u>X</u>	<u> </u>	<u> </u>
Pesticide/PBB mid-point standard	<u>X</u>	<u> </u>	<u> </u>
instrument blanks	<u>X</u>	<u> </u>	<u> </u>
Are Forms VI 1-4 present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses of INDA and INDB within limits for both columns?	<u>X</u>	<u> </u>	<u> </u>
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u>X</u>	<u> </u>	<u> </u>
Is Form VII-1 present for each BCS analyzed for both columns?	<u>X</u>	<u> </u>	<u> </u>
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT	<u> </u>	<u>X</u>	<u> </u>
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	<u>X</u>	<u> </u>	<u> </u>
Is Form VII-2 present and complete for each mid-point standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are RPD values for all compounds < 25%?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is Form VIII present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u> </u>	<u> </u>
Are all samples listed on the form?	<u>X</u>	<u> </u>	<u> </u>
If GPC cleanup was performed, is Form IX-2 present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u> </u>	<u> </u>
GPC calibration (80-110%)	<u> </u>	<u> </u>	<u>X</u>
<u>Pesticide/PBB Identification</u>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u> </u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u> </u>	<u>X</u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

Pesticide/PBB Qualifier Summary
Holding Time and Surrogates

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40141W	OK for all samples	ok	ok	ok	okk
K40142W					
K40143W					
K40144W					
K40145W					
K40136W					
K40147W					
K40148W					
K40149W					
K40150W					
K40151W					
K40202W					
K40202WMS					
K40202WMSD					
K40203W					
K40204W					
K40205W					
K40206W					
K40207W					
K40208W					
K40209W					
K40210W					

TCX Tetrachloro-m-xylene

DCB Decachlorobiphenyl

D Surrogate diluted out

↑ Recovery high

↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: HP2404

Column: RTX-5

Date:	5/12/94	5/13	5/14	5/14		
Time:	17:54	16:30	00:50	09:10		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	30.2	25.5		
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:			K40141W	K40143W		
			K40142W	K40144W		
			K40143W	K40145W		
			K40144W	K40146W		
			K40145W	K40147W		
			K40146W	K40148W		
			K40147W	K40149W		

		K40148W	K40150W		
		K40149W	K40151W		
		K40150W			
		K40151W			

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404

Column: RTX-35

Date:	5/12/94	5/13	5/13	5/14		
Time:	17:54	16:30	00:50	09:10		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok		
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:						

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404

Column: RTX-5

Date:	5/26/94	5/27	5/27				
Time:	18:18	08:35	12:44				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 5

Instrument: HP2404
 Column: RTX-35

Date:	5/26/94	5/27	5/27			
Time:	18:18	08:35	12:44			
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok			
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptachlor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Affected Samples:						

Corrected Sample Analysis Data Sheets

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40141W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 197869
 Date Received: 09/18/93
 Date Extracted: 04/13/94
 Date Analyzed: 05/13/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.010	JN
1024-57-3	Heptachlor Epoxide	0.0095	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.0066	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40142W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39566

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 197870
Date Received: 09/18/93
Date Extracted: 04/13/94
Date Analyzed: 05/13/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.013	
1024-57-3	Heptachlor Epoxide	0.017	JN
5103-74-2	gamma-Chlordane	0.0053	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.026	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R
R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40143W

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 39566Phase Type: BiotaPhase Weight: 10.0 gExtraction: SoxhletDilution Factor: 1.0Lab Sample ID: 197871Date Received: 09/18/93Date Extracted: 04/13/94Date Analyzed: 05/14/94Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.022	JN
1024-57-3	Heptachlor Epoxide	0.027	
5103-74-2	gamma-Chlordane	0.0093	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.035	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40144W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 197872
 Date Received: 09/18/93
 Date Extracted: 04/13/94
 Date Analyzed: 05/14/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
300-00-2	Aldrin	0.0088	
1024-57-3	Heptachlor Epoxide	0.011	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40145W

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 39566Phase Type: BiotaPhase Weight: 10.0 gExtraction: SoxhletDilution Factor: 1.0Lab Sample ID: 197873Date Received: 09/18/93Date Extracted: 04/13/94Date Analyzed: 05/14/94Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0088	JN
1024-57-3	Heptachlor Epoxide	0.0053	JN
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.013	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40146W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 197874
 Date Received: 09/18/93
 Date Extracted: 04/13/94
 Date Analyzed: 05/14/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.011	
1024-57-3	Heptachlor Epoxide	0.015	
5103-74-2	gamma-Chlordane	0.0050	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.021	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R
R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40147W

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 39566Lab Sample ID: 197875Date Received: 09/18/93Date Extracted: 04/13/94Date Analyzed: 05/14/94Sulfur Clean-up: N

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.011	JN
1024-57-3	Heptachlor Epoxide	0.0062	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.016	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40148W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 197876
 Date Received: 09/18/93
 Date Extracted: 04/13/94
 Date Analyzed: 05/14/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.022	JN
1024-57-3	Heptachlor Epoxide	0.031	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.038	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40149W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 197877
 Date Received: 09/18/93
 Date Extracted: 04/13/94
 Date Analyzed: 05/14/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.012	JN
1024-57-3	Heptachlor Epoxide	0.017	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.019	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

K40150W

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 197878
 Date Received: 09/18/93
 Date Extracted: 04/13/94
 Date Analyzed: 05/14/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.013	JN
1024-57-3	Heptachlor Epoxide	0.015	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.017	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40151W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 197879
 Date Received: 09/18/93
 Date Extracted: 04/13/94
 Date Analyzed: 05/14/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0096	JN
1024-57-3	Heptachlor Epoxide	0.011	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.016	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40202W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 3.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200182
 Date Received: 10/09/93
 Date Extracted: 05/23/94
 Date Analyzed: 05/27/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.034	U
2113-57-7	3-Bromobiphenyl	0.034	U
92-66-0	4-Bromobiphenyl	0.034	U
118-74-1	Hexachlorobenzene	0.017	U
58-89-9	gamma-BHC	0.017	U
309-00-2	Aldrin	0.043	J
1024-57-3	Heptachlor Epoxide	0.035	U
5103-74-2	gamma-Chlordane	0.017	U
5103-71-9	alpha-Chlordane	0.017	U
39765-80-5	trans-Nonachlor	0.017	U
72-55-9	4,4'-DDE	0.037	J
60-57-1	Dieldrin	0.034	U
72-54-8	4,4'-DDD	0.034	U
5103-73-1	cis-Nonachlor	0.017	U
50-29-3	4,4'-DDT	0.034	U
36355-01-8	Hexabromobiphenyl	0.067	U
8001-35-2	Toxaphene	0.67	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40203W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200183
 Date Received: 10/09/94
 Date Extracted: 05/24/94
 Date Analyzed: 05/27/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.017	JN
1024-57-3	Heptachlor Epoxide	0.018	
5103-74-2	gamma-Chlordane	0.0050	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.023	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40204W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.4 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200184
 Date Received: 10/09/94
 Date Extracted: 05/24/94
 Date Analyzed: 05/27/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.0097	U
2113-57-7	3-Bromobiphenyl	0.0097	U
92-66-0	4-Bromobiphenyl	0.0097	U
118-74-1	Hexachlorobenzene	0.0049	U
58-89-9	gamma-BHC	0.0049	U
309-00-2	Aldrin	0.020	JN
1024-57-3	Heptachlor Epoxide	0.023	
5103-74-2	gamma-Chlordane	0.0062	
5103-71-9	alpha-Chlordane	0.0049	U
39765-80-5	trans-Nonachlor	0.0049	U
72-55-9	4,4'-DDE	0.026	
60-57-1	Dieldrin	0.0097	U
72-54-8	4,4'-DDD	0.0097	U
5103-73-1	cis-Nonachlor	0.0049	U
50-29-3	4,4'-DDT	0.0097	U
36355-01-8	Hexabromobiphenyl	0.019	U
8001-35-2	Toxaphene	0.19	U

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40205W

SDG: 39566

Phase Type: Biota
Phase Weight: 10.3 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200185
Date Received: 10/09/94
Date Extracted: 05/24/94
Date Analyzed: 05/27/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.0098	U
2113-57-7	3-Bromobiphenyl	0.0098	U
92-66-0	4-Bromobiphenyl	0.0098	U
118-74-1	Hexachlorobenzene	0.0049	U
58-89-9	gamma-BHC	0.0049	U
300-00-2	Aldrin	0.021	
1024-57-3	Heptachlor Epoxide	0.023	
5103-74-2	gamma-Chlordane	0.0077	
5103-71-9	alpha-Chlordane	0.0049	U
39765-80-5	trans-Nonachlor	0.0049	U
72-55-9	4,4'-DDE	0.030	
60-57-1	Dieldrin	0.0098	U
72-54-8	4,4'-DDD	0.0098	U
5103-73-1	cis-Nonachlor	0.0049	U
50-29-3	4,4'-DDT	0.0092	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40206W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39566

Phase Type: Biota
Phase Weight: 10.2 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200186
Date Received: 10/09/94
Date Extracted: 05/24/94
Date Analyzed: 05/27/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.0099	U
2113-57-7	3-Bromobiphenyl	0.0099	U
92-66-0	4-Bromobiphenyl	0.0099	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.018	JN
1024-57-3	Heptachlor Epoxide	0.022	
5103-74-2	gamma-Chlordane	0.0056	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.025	
60-57-1	Dieldrin	0.0099	U
72-54-8	4,4'-DDD	0.0099	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.0099	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40207W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.3 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200187
 Date Received: 10/09/94
 Date Extracted: 05/24/94
 Date Analyzed: 05/27/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.0098	U
2113-57-7	3-Bromobiphenyl	0.0098	U
92-66-0	4-Bromobiphenyl	0.0098	U
118-74-1	Hexachlorobenzene	0.0049	U
58-89-9	gamma-BHC	0.0049	U
309-00-2	Aldrin	0.024	JN
1024-57-3	Heptachlor Epoxide	0.024	
5103-74-2	gamma-Chlordane	0.0066	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.028	J
60-57-1	Dieldrin	0.0098	U
72-54-8	4,4'-DDD	0.0098	U
5103-73-1	cis-Nonachlor	0.0049	U
50-29-3	4,4'-DDT	0.0098	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40208W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200188
 Date Received: 10/09/94
 Date Extracted: 05/24/94
 Date Analyzed: 05/27/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.024	JN
1024-57-3	Heptachlor Epoxide	0.027	
5103-74-2	gamma-Chlordane	0.0075	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.032	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40209W

SDG: 39566

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200189
Date Received: 10/09/94
Date Extracted: 05/24/94
Date Analyzed: 05/27/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.016	
1024-57-3	Heptachlor Epoxide	0.021	
5103-74-2	gamma-Chlordane	0.0056	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.033	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40210W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39566

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200190
 Date Received: 10/09/94
 Date Extracted: 05/24/94
 Date Analyzed: 05/27/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.019	
1024-57-3	Heptachlor Epoxide	0.023	
5103-74-2	gamma-Chlordane	0.0062	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.027	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R
R

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

CRDL standard recovery was slightly above acceptable limits. No data fell in the affected range so no data qualification was necessary.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Due to a laboratory error, the sample intended to be used as the matrix spike was not spiked; therefore, no matrix spike recovery data is available.

4.2 Laboratory Duplicate

The difference between laboratory duplicates was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. General Comments

Due to a laboratory error, matrix spiking solution was inadvertently added to sample K40203. Data for this sample has been rejected.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u> </u>	<u> </u>
Sample No.?	<u>X</u>	<u> </u>	<u> </u>
SDG No.?	<u>X</u>	<u> </u>	<u> </u>
Correct units?	<u>X</u>	<u> </u>	<u> </u>
Matrix?	<u>X</u>	<u> </u>	<u> </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u> </u>	<u> </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u> </u>	<u> </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u> </u>	<u> </u>
Is the distillation log for cyanides present?	<u> </u>	<u> </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u> </u>	<u> </u>
Are the measurement read out records present for:			
ICP	<u> </u>	<u> </u>	<u>X</u>
Flame AA	<u> </u>	<u> </u>	<u>X</u>
Furnace AA	<u> </u>	<u> </u>	<u>X</u>
Mercury	<u>X</u>	<u> </u>	<u> </u>
Cyanides	<u> </u>	<u> </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u> </u>	<u> </u>
Is the data properly labeled?	<u>X</u>	<u> </u>	<u> </u>
<u>Holding Times</u>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u> </u>	<u> </u>

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Form I (Final Data)			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Calibration</u>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form II A (Initial and Continuing Calibration Verification)</u>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)?			X
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form IV (ICP Interference Check Sample)</u>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ($\pm 20\%$)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u>			
Present and complete for:			
each SDG?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
between 10-74%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form VI (Lab Duplicates)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		X	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
<u>Form VII (Laboratory Control Sample)</u>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<u>Form IX (ICP Serial Dilution)</u>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
\geq 100%?			X
<u>Furnace Atomic Absorbtion (AA) QC Analysis</u>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form VIII (Method of Standard Addition Results)</u>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Field Blank</u>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X, XI, XII (Verification of Instrumental Parameters)</u>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X (Instrument Detection Limits)</u>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u> </u>	<u> X </u>	<u> </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher linear range of ICP.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u> </u>	<u> X </u>	<u> </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u> </u>	<u> </u>	<u> X </u>

Corrected Sample Analysis Data Sheets

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40141W

Name: AQUATEC Contract: 91082
Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39566
Matrix (soil/water): FISH Lab Sample ID: 197869
Level (low/med): LOW Date Received: 09/18/93
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:
Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40142W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 197870

Level (low/med): LOW _____ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40143W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39566_

Matrix (soil/water): FISH_ Lab Sample ID: 197871

Level (low/med): LOW_ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40144W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 197872

Level (low/med): LOW _____ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40145W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39566_

Matrix (soil/water): FISH_

Lab Sample ID: 197873

Level (low/med): LOW_

Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40146W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 197874

Level (low/med): LOW _____ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40147W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 197875

Level (low/med): LOW _____ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		M	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40148W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39566_

Matrix (soil/water): FISH_ Lab Sample ID: 197876

Level (low/med): LOW_ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40149W

Lab Name: AQUATEC_____ Contract: 91082_____

Lab Code: AQUAI_____ Case No.: BIO_____ SAS No.: _____ SDG No.: 39566_____

Matrix (soil/water): FISH_____ Lab Sample ID: 197877

Level (low/med): LOW_____ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40150W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 197878

Level (low/med): LOW _____

Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40151W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 197879

Level (low/med): LOW _____ Date Received: 09/18/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40202W

Lab Name: AQUATEC_____ Contract: 91082_____

Lab Code: AQUAI_____ Case No.: BIO_____ SAS No.: _____ SDG No.: 39566_____

Matrix (soil/water): FISH_____

Lab Sample ID: 200182

Level (low/med): LOW_____

Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40203W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200183

Level (low/med): LOW _____ Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.11		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40204W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39566_

Matrix (soil/water): FISH_ Lab Sample ID: 200184

Level (low/med): LOW_ Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.03	-	N	CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40205W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39566

Matrix (soil/water): FISH Lab Sample ID: 200185

Level (low/med): LOW Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40206W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200186

Level (low/med): LOW _____ Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40207W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200187

Level (low/med): LOW _____ Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		M	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40208W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39566

Matrix (soil/water): FISH Lab Sample ID: 200188

Level (low/med): LOW Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40209W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39566 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200189

Level (low/med): LOW _____ Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40210W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39566

Matrix (soil/water): FISH

Lab Sample ID: 200190

Level (low/med): LOW

Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	% Lipids
K40141W	White Sucker	female	0.72
K40142W	White Sucker	male	0.66
K40143W	White Sucker	male	0.66
K40144W	White Sucker	female	0.67
K40145W	White Sucker	female	0.73
K40146W	White Sucker	female	0.68
K40147W	White Sucker	male	0.68
K40148W	White Sucker	female	1.23
K40149W	White Sucker	male	0.66
K40150W	White Sucker	male	0.79
K40151W	White Sucker	male	0.77
K40202W	White Sucker	female	2.96
K40203W	White Sucker	male	1.22
K40204W	White Sucker	female	2.37
K40205W	White Sucker	male	1.87
K40206W	White Sucker	female	2.39
K40207W	White Sucker	male	4.41
K40208W	White Sucker	male	2.23
K40209W	White Sucker	male	1.11
K40210W	White Sucker	male	1.27

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# 39955

PCB, PESTICIDE AND
MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 39055 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	%Lipid
K40169F	216157	carp	fillet	Below Allegan Dam	x	x
K40169R	216158	carp	carcass	Below Allegan Dam		x
K40170F	216159	carp	fillet	Below Allegan Dam	x	x
K40170R	216160	carp	carcass	Below Allegan Dam		x
K40179F	216161	carp	fillet	Near Saugatuck	x	x
K40179R	216162	carp	carcass	Near Saugatuck		x
K40180F*	216163	carp	fillet	Near Saugatuck	x	x
K40180R	216164	carp	carcass	Near Saugatuck		x
K40181F	216165	carp	fillet	Near Saugatuck	x	x
K40181R	216166	carp	carcass	Near Saugatuck		x
K40182F	216167	carp	fillet	Near Saugatuck	x	x
K40182R	216168	carp	carcass	Near Saugatuck		x
K40183F	216169	carp	fillet	Near Saugatuck	x	x
K40183R	216170	carp	carcass	Near Saugatuck		x
K40184F	216171	carp	fillet	Near Saugatuck	x	x
K40184R	216172	carp	carcass	Near Saugatuck		x
K40185F	216173	carp	fillet	Near Saugatuck	x	x
K40185R	216174	carp	carcass	Near Saugatuck		x
K40186F	216175	carp	fillet	Near Saugatuck	x	x
K40186R	216176	carp	carcass	Near Saugatuck		x
K40187F	216177	carp	fillet	Near Saugatuck	x	x
K40187R	216178	carp	carcass	Near Saugatuck		x
K40188F	216179	carp	fillet	Near Saugatuck	x	x
K40188R	216180	carp	carcass	Near Saugatuck		x
K40189F	216181	carp	fillet	Near Saugatuck	x	x
K40189R	216182	carp	carcass	Near Saugatuck		x
K40258F	216187	carp	fillet	Otsego City Dam	x	x
K40258R	216188	carp	carcass	Otsego City Dam		x

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	%Lipid
K40259F	216189	carp	fillet	Otsego City Dam	x	x
K40259R	216190	carp	carcass	Otsego City Dam		x
K40260F	216191	carp	fillet	Otsego City Dam	x	x
K40260R	216192	carp	carcass	Otsego City Dam		x
K40261F	216193	carp	fillet	Otsego City Dam	x	x
K40261R	216194	carp	carcass	Otsego City Dam		x
K40262F	216195	carp	fillet	Otsego City Dam	x	x
K40262R	216196	carp	carcass	Otsego City Dam		x

* MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recovery of Aroclor 1254 in the matrix spike duplicate sample was below acceptable control limits. The relative percent difference between recoveries (RPD) for Aroclor 1254 was also outside the acceptable control limits. All matrix spike blank recoveries were, however, within acceptable control limits. The deviation is believed to be an isolated incident; therefore, no qualifiers have been added to the data based on spike performance.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u> </u>	<u> </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u> </u>	<u>X</u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 1 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 1 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Instrument Blanks	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u> </u>	<u> </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40169F	OK for all samples	OK	OK	OK	OK
K40170F					
K40179F					
K40180F					
K40180FMS					
K40180FMSD					
K40181F					
K40182F					
K40183F					
K40184F					
K40185F					
K40186F					
K40187F					
K40188F					
K40189F					
K40258F					
K40259F					
K40260F					
K40261F					
K40262F					

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 ↑ Recovery high
 ↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:	4/30/94 0543	5/7	5/7	5/7	5/7	5/7	5/7
Time:	to 5/1/94 0106	0809	0843	1534	1608	2258	2333
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.2 / 4.4		3.0				
Aroclor 1221	5.1 / 6.9						
Aroclor 1232	4.2 / 3.1						
Aroclor 1242	3.1 / 3.4				2.0		
Aroclor 1248	3.4 / 3.0	3.0		2.0		0.5	
Aroclor 1254	3.1 / 3.6						5.0
Aroclor 1260	3.8 / 3.4						
Tetrachloro-m-xylene	5.2 / 6.4						
Decachlorobiphenyl	7.9 / 8.1						
Affected Samples:							

PCB Calibration Summary - Page 2

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:		5/8	5/8	5/8	5/8	5/9	5/9
Time:		0624	0658	1058	1132	1255	1330
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016					3.0		
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		0.0		1.0		3.0	
Aroclor 1254							
Aroclor 1260			2.5				3.0
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

PCB Calibration Summary - Page 3

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:		5/10	5/10	5/10	5/10		
Time:		0423	0457	1147	1221		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016			0.5				
Aroclor 1221							
Aroclor 1232							
Aroclor 1242					6.0		
Aroclor 1248		5.0		6.5			
Aroclor 1254							
Aroclor 1260							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40169F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216157

Phase Weight: 10.0 (g)

Date Received: 10/07/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 5.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.8	
11096-82-5	Aroclor-1260	0.25	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40170F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216159

Phase Weight: 10.0 (g)

Date Received: 10/07/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 5.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.5	
11096-82-5	Aroclor-1260	0.29	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40179F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216161

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 5.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.9	
11096-82-5	Aroclor-1260	0.26	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40180F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216163

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 5.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.6	
11096-82-5	Aroclor-1260	0.29	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40181F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216165

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/27/94

Dilution Factor: 5.0

Date Analyzed: 05/09/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	2.2	
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.25	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40182F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216167

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 2.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Aroclor-1260	0.29	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40183F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216169

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 15.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.75	U
11104-28-2	Aroclor-1221	0.75	U
11141-16-5	Aroclor-1232	0.75	U
53469-21-9	Aroclor-1242	0.75	U
12672-29-6	Aroclor-1248	0.75	U
11097-69-1	Aroclor-1254	8.5	
11096-82-5	Aroclor-1260	0.75	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40184F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216171

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 5.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.3	
11096-82-5	Aroclor-1260	0.28	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40185F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216173

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 15.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.75	U
11104-28-2	Aroclor-1221	0.75	U
11141-16-5	Aroclor-1232	0.75	U
53469-21-9	Aroclor-1242	0.75	U
12672-29-6	Aroclor-1248	0.75	U
11097-69-1	Aroclor-1254	8.7	
11096-82-5	Aroclor-1260	0.75	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40186F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216175

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 5.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	3.0	
11096-82-5	Aroclor-1260	0.25	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40187F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216177

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 15.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.75	U
11104-28-2	Aroclor-1221	0.75	U
11141-16-5	Aroclor-1232	0.75	U
53469-21-9	Aroclor-1242	0.75	U
12672-29-6	Aroclor-1248	0.75	U
11097-69-1	Aroclor-1254	7.9	
11096-82-5	Aroclor-1260	0.98	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40188F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216179

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 15.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.75	U
11104-28-2	Aroclor-1221	0.75	U
11141-16-5	Aroclor-1232	0.75	U
53469-21-9	Aroclor-1242	0.75	U
12672-29-6	Aroclor-1248	0.75	U
11097-69-1	Aroclor-1254	7.7	
11096-82-5	Aroclor-1260	1.4	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40189F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216181

Phase Weight: 10.0 (g)

Date Received: 10/08/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 10.0

Date Analyzed: 05/08/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	3.1	
11096-82-5	Aroclor-1260	0.62	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40258F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216187

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 10.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	4.5	
11097-69-1	Aroclor-1254	2.7	
11096-82-5	Aroclor-1260	0.83	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40259F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216189

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 5.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Aroclor-1260	0.79	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40260F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216191

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 2.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	1.1	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.34	
11096-82-5	Aroclor-1260	0.10	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40261F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216193

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 5.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.7	
11096-82-5	Aroclor-1260	0.28	

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40262F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39955

Phase Type: BIOTA

Lab Sample ID: 216195

Phase Weight: 10.0 (g)

Date Received: 10/13/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/08/94

Dilution Factor: 10.0

Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	5.9	
11096-82-5	Aroclor-1260	1.4	

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. All samples were originally analyzed within the acceptable holding time. Dilutions for samples K40169F, K40170F, K40180F, K40182F, K40183F, K40185F, K40187F, K40188F, K40189F, K40258F, K40259F, K40260F and K40262F were, however, analyzed over the specified holding time. All data for the dilutions have been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exceptions:

Instrument HP2404 RTX-5 5/18/93 07:37

2-Bromobiphenyl 27.1%

All data for this compound in samples K40169F, K40170F, K40179F, K40180F, K40182F, K40183F, K40184F, K40185F, K40186F, K40187F, K40188F and K40189F have been qualified as estimated due to the deviation.

Instrument HP2404 RTX-5 5/20/93 01:18

2-Bromobiphenyl 55.4%

All data for this compound in samples K40169FDL, K40180FDL, K40182FDL, K40183FDL, K40185FDL, K40187FDL, K40188FDL, K40189FDL, K40258FDL, K40259FDL, K40260FDL and K40262FDL have been qualified as estimated due to the deviation.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40169F	2-Bromobiphenyl	303.9%
	Hexachlorobenzene	127.1%
	Aldrin	49.3%
	gamma-Chlordane	75.8%
	trans-Nonachlor	36.6%
	cis-Nonachlor	59.3%
	4,4'-DDT	324.5%

K40169FDL	2-Bromobiphenyl	218.6%
	Aldrin	52.8%
	gamma-Chlordane	69.9%
	trans-Nonachlor	44.1%
	cis-Nonachlor	57.9%
	4,4'-DDT	366.1%
K40170F	2-Bromobiphenyl	341.6%
	Hexachlorobenzene	64.6%
	Aldrin	45.0%
	gamma-Chlordane	45.0%
	trans-Nonachlor	30.5%
	cis-Nonachlor	40.6%
	4,4'-DDT	269.7%
K40170FDL	2-Bromobiphenyl	289.0%
	Aldrin	53.3%
	gamma-Chlordane	46.4%
	trans-Nonachlor	38.2%
	4,4'-DDT	300.6%
K40179F	2-Bromobiphenyl	251.2%
	Aldrin	72.1%
	gamma-Chlordane	96.4%
	trans-Nonachlor	78.5%
	4,4'-DDT	409.7%
K40180F	2-Bromobiphenyl	377.7%
	Hexachlorobenzene	84.0%
	Heptachlor Epoxide	38.8%
	cis-Nonachlor	39.8%
	4,4'-DDT	208.5%
K40180FDL	2-Bromobiphenyl	259.3%
	Hexachlorobenzene	117.5%
	Heptachlor Epoxide	37.8%
	cis-Nonachlor	52.0%
	4,4'-DDT	237.2%
K40181F	Aldrin	56.0%
	alpha-Chlordane	42.0%
	gamma-Chlordane	153.8%
	trans-Nonachlor	343.6%
	cis-Nonachlor	27.8%
	Dieldrin	129.7%
	4,4'-DDT	132.1%
K40182F	2-Bromobiphenyl	303.9%
	Hexachlorobenzene	88.5%
	gamma-BHC	802.7%
	Aldrin	52.0%
	Heptachlor Epoxide	37.2%
	4,4'-DDT	204.6%

K40182FDL	2-Bromobiphenyl	245.2%
	Aldrin	57.2%
	Heptachlor Epoxide	33.2%
	4,4'-DDT	229.7%
K40183F	Aldrin	101.7%
	gamma-Chlordane	129.7%
	trans-Nonachlor	296.2%
	4,4'-DDT	663.0%
K40183FDL	Aldrin	106.8%
	gamma-Chlordane	120.1%
	trans-Nonachlor	345.5%
	4,4'-DDT	697.7%
K40184F	2-Bromobiphenyl	212.6%
	Aldrin	90.0%
	gamma-Chlordane	110.9%
	trans-Nonachlor	420.0%
	4,4'-DDT	675.6%
K40185F	2-Bromobiphenyl	29.0%
	Aldrin	86.9%
	gamma-Chlordane	92.7%
	trans-Nonachlor	213.9%
	4,4'-DDT	624.5%
K40185FDL	Aldrin	88.7%
	gamma-Chlordane	91.7%
	trans-Nonachlor	345.3%
	4,4'-DDT	681.5%
K40186F	Aldrin	76.7%
	gamma-Chlordane	100.9%
	trans-Nonachlor	349.4%
	cis-Nonachlor	31.0%
	4,4'-DDT	602.7%
K40187F	Aldrin	125.5%
	gamma-Chlordane	91.1%
	4,4'-DDT	525.7%
K40187FDL	Aldrin	122.4%
	gamma-Chlordane	87.6%
	4,4'-DDT	546.1%
K40188F	Aldrin	90.0%
	4,4'-DDT	630.1%
K40188FDL	Aldrin	90.8%
	gamma-Chlordane	88.4%
	4,4'-DDT	645.7%

K40189F	Aldrin	96.9%
	Heptachlor Epoxide	108.7%
	gamma-Chlordane	145.1%
	trans-Nonachlor	193.8%
	4,4'-DDT	654.7%
K40189FDL	Aldrin	99.2%
	Heptachlor Epoxide	85.2%
	alpha-Chlordane	25.3%
	gamma-Chlordane	120.4%
	4,4'-DDT	681.9%
K40258F	Aldrin	47.7%
	gamma-Chlordane	86.7%
	trans-Nonachlor	94.9%
	Dieldrin	80.4%
	4,4'-DDT	499.3%
K40258FDL	Aldrin	48.7%
	gamma-Chlordane	86.8%
	Dieldrin	101.1%
	4,4'-DDT	546.8%
K40259F	Aldrin	30.6%
	Heptachlor Epoxide	365.2%
	alpha-Chlordane	33.0%
	gamma-Chlordane	90.7%
	trans-Nonachlor	265.4%
	Dieldrin	83.1%
	4,4'-DDT	603.5%
K40259FDL	Aldrin	36.0%
	Heptachlor Epoxide	300.0%
	alpha-Chlordane	46.2%
	gamma-Chlordane	69.4%
	Dieldrin	26.3%
	4,4'-DDT	676.4%
K40260F	Aldrin	30.5%
	Heptachlor Epoxide	440.6%
	gamma-Chlordane	110.0%
	trans-Nonachlor	36.3%
	4,4'-DDT	59.5%
K40260FDL	Aldrin	30.5%
	Heptachlor Epoxide	395.2%
	gamma-Chlordane	98.2%
	trans-Nonachlor	37.2%
	4,4'-DDT	70.1%

K40261F	Aldrin	66.6%
	Heptachlor Epoxide	731.9%
	gamma-Chlordane	68.7%
	trans-Nonachlor	395.8%
	4,4'-DDD	25.6%
	4,4'-DDE	33.5%
	4,4'-DDT	675.1%
K40262F	Aldrin	31.3%
	Heptachlor Epoxide	39.4%
	gamma-Chlordane	102.9%
	4,4'-DDT	667.7%
K40262FDL	Aldrin	32.1%
	gamma-Chlordane	96.0%
	4,4'-DDT	684.7%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries for Aldrin were above the acceptable control limit in both the matrix spike and matrix spike duplicate samples. Recovery of Dieldrin was also above the acceptable control limit in the matrix spike sample. The elevated recoveries were most likely due to positive interference from PCBs present in the samples. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers were added to the samples based on matrix spike performance.

8. General Comments

The recommended data usage for the sample dilutions is as follows:

K40169F and K40169FDL

The data from sample K40169F should be used for all compounds except Hexachlorobenzene and 4,4'-DDE. The data from the dilution K40169FDL should be used for Hexachlorobenzene and 4,4'-DDE only.

K40170F and K40170FDL

The data from sample K40170F should be used for all compounds except 4,4'-DDE. The data from the dilution K40170FDL should be used for 4,4'-DDE only.

K40180F and K40180FDL

The data from sample K40180F should be used for all compounds except alpha-Chlordane, trans-Nonachlor, Dieldrin and 4,4'-DDE. The data from the dilution K40180FDL should be used for alpha-Chlordane, trans-Nonachlor, Dieldrin and 4,4'-DDE only.

K40182F and K40182FDL

The data from sample K40182F should be used for all compounds except gamma-BHC and 4,4'-DDE. The data from the dilution K40182FDL should be used for gamma-BHC and 4,4'-DDE only.

K40183F and K40183FDL

The data from sample K40183F should be used for all compounds except 4,4'-DDE. The data from the dilution K40183FDL should be used for 4,4'-DDE only.

K40185F and K40185FDL

The data from sample K40185F should be used for all compounds except 4,4'-DDE. The data from the dilution K40185FDL should be used for 4,4'-DDE only.

K40187F and K40187FDL

The data from sample K40187F should be used for all compounds except gamma-Chlordane and 4,4'-DDE. The data from the dilution K40187FDL should be used for gamma-Chlordane and 4,4'-DDE only.

K40188F and K40188FDL

The data from sample K40188F should be used for all compounds except 4,4'-DDE. The data from the dilution K40188FDL should be used for 4,4'-DDE only.

K40189F and K40189FDL

The data from sample K40189F should be used for all compounds except Heptachlor Epoxide, trans-Nonachlor and 4,4'-DDE. The data from the dilution K40189FDL should be used for Heptachlor Epoxide, trans-Nonachlor and 4,4'-DDE only.

K40258F and K40258FDL

The data from sample K40258F should be used for all compounds except Aldrin, trans-Nonachlor and 4,4'-DDE. The data from the dilution K40258FDL should be used for Aldrin, trans-Nonachlor and 4,4'-DDE only.

K40259F and K40259FDL

The data from sample K40259F should be used for all compounds except gamma-Chlordane, trans-Nonachlor and 4,4'-DDE. The data from the dilution K40259FDL should be used for gamma-Chlordane, trans-Nonachlor and 4,4'-DDE only.

K40260F and K40260FDL

The data from sample K40260F should be used for all compounds except 4,4'-DDE. The data from the dilution K40260FDL should be used for 4,4'-DDE only.

K40262F and K40262FDL

The data from sample K40262F should be used for all compounds except 4,4'-DDE. The data from the dilution K40262FDL should be used for 4,4'-DDE only.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are the surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u> </u>	<u> </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u> </u>	<u>X</u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
Were the method blanks reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 3 </u> out of <u> 8 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
<u>Blanks</u>			
Is the method blank summary form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any trip/field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	<u>X</u>	<u> </u>	<u> </u>
performance evaluation mixtures (BCS)	<u>X</u>	<u> </u>	<u> </u>
Toxaphene multipoint calibration	<u>X</u>	<u> </u>	<u> </u>
Pesticide/PBB multipoint calibration	<u>X</u>	<u> </u>	<u> </u>
Pesticide/PBB mid-point standard	<u>X</u>	<u> </u>	<u> </u>
instrument blanks	<u>X</u>	<u> </u>	<u> </u>
Are Forms VI 1-4 present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	<u>X</u>	<u> </u>	<u> </u>
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u>X</u>	<u> </u>	<u> </u>
Is Form VII-1 present for each BCS analyzed for both columns?	<u>X</u>	<u> </u>	<u> </u>
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT	<u> </u>	<u>X</u>	<u> </u>
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	<u> </u>	<u>X</u>	<u> </u>
Is Form VII-2 present and complete for each mid-point standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are RPD values for all compounds < 25%?	<u> </u>	<u>X</u>	<u> </u>
<u>Analytical Sequence Check</u>			

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Is Form VIII present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u> </u>	<u>X</u>	<u> </u>
Are all samples listed on the form?	<u> </u>	<u> </u>	<u>X</u>
If GPC cleanup was performed, is Form IX-2 present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u> </u>	<u> </u>	<u>X</u>
GPC calibration (80-110%)	<u> </u>	<u> </u>	<u>X</u>
<u>Pesticide/PBB Identification</u>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u> </u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u> </u>	<u>X</u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

Pesticide/PBB Qualifier Summary
Holding Time and Surrogates

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40169F		OK	OK	OK	OK
K40169FDL	+1				
K40170F					
K40170FDL	+3				
K40179F					
K40180F					
K40180FDL	+1				
K40180FMS					
K40180FMSD					
K40182F					
K40182FDL	+1				
K40183F					
K40183FDL	+1				
K40184F					
K40185F					
K40185FDL	+2				
K40186F					
K40187F					
K40187FDL	+2				
K40188F					
K40188FDL	+2				
K40189F					
K40189FDL	+2				
K40258F					
K40258FDL	+2				
K40259F					
K40259FDL	+2				
K40260F					
K40260FDL	+2				
K40261F					
K40262F					

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40262FDL	+2				

Surrogates:

TCX Tetrachloro-m-xylene

DCB Decachlorobiphenyl

Qualifiers:

D Surrogate diluted out

↑ Recovery high

↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: HP2404
Column: RTX-5

Date:	5/17/94	5/18	5/18	5/19	5/19	5/20	5/20
Time:	17:19	07:36	15:56	00:16	16:57	01:18	09:38
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	27.1%	ok	ok	ok	55.4%	ok
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:		K40169F				K40169FDL	
		K40170F				K40180FDL	
		K40179F				K40182FDL	
		K40180F				K40183FDL	
		K40182F				K40185FDL	
		K40183F				K40187FDL	
		K40184F				K40188FDL	

Pesticide/PBB Calibration Summary - Page 2

	K40185F				K40189FDL	
	K40186F				K40258FDL	
	K40187F				K40259FDL	
	K40188F				K40260FDL	
	K40189F				K40262FDL	
	K40180F- MS					
	K40180F- MSD					

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404

Column: RTX-5

Date:		5/21	5/22				
Time:		10:37	10:29				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl		ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404Column: RTX-35

Date:	5/17/94	5/18	5/18	5/19	5/19	5/20	5/20
Time:	17:19	07:36	15:56	00:16	16:57	01:18	09:38
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok	ok	ok
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 5

Instrument: HP2404

Column: RTX-35

Date:		5/21	5/22				
Time:		10:37	10:29				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl		ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Corrected Sample Analysis Data Sheets

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40169F

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216157
Date Received: 10/07/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.051	
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.010 0.0071	UD
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.054	J
1024-57-3	Heptachlor Epoxide	0.058	
5103-74-2	gamma-Chlordane	0.033	JN
5103-71-9	alpha-Chlordane	0.047	
39765-80-5	trans-Nonachlor	0.049	J
72-55-9	4,4'-DDE	0.20 0.19	* DJ
60-57-1	Dieldrin	0.10	
72-54-8	4,4'-DDD	0.066	
5103-73-1	cis-Nonachlor	0.028	JN
50-29-3	4,4'-DDT	0.029	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40170F

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216159
Date Received: 10/07/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.048	
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0096	JN
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.042	J
1024-57-3	Heptachlor Epoxide	0.046	
5103-74-2	gamma-Chlordane	0.035	J
5103-71-9	alpha-Chlordane	0.051	
39765-80-5	trans-Nonachlor	0.050	J
72-55-9	4,4'-DDE	0.29 0.26	* DJ
60-57-1	Dieldrin	0.16	
72-54-8	4,4'-DDD	0.066	
5103-73-1	cis-Nonachlor	0.029	J
50-29-3	4,4' DDT	0.035	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u> Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	Client ID No. <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 5px 0;">K40179F</div> SDG: <u>39955</u> Lab Sample ID: <u>216161</u> Date Received: <u>10/08/93</u> Date Extracted: <u>04/08/94</u> Date Analyzed: <u>05/18/94</u> Sulfur Clean-up: <u>N</u>
--	---

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.050	
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.035	JN
1024-57-3	Heptachlor Epoxide	0.031	
5103-74-2	gamma-Chlordane	0.020	
5103-71-9	alpha-Chlordane	0.023	
39765-80-5	trans-Nonachlor	0.026	JN
72-55-9	4,4'-DDE	0.16	
60-57-1	Dieldrin	0.073	
72-54-8	4,4'-DDD	0.038	
5103-73-1	cis-Nonachlor	0.032	
50-29-3	4,4'-DDT	0.026	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40180F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216163
Date Received: 10/08/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.041	
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.012	JN
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.034	
1024-57-3	Heptachlor Epoxide	0.049	J
5103-74-2	gamma-Chlordane	0.063	
5103-71-9	alpha-Chlordane	0.11 0.10	* DJ
39765-80-5	trans-Nonachlor	0.11 0.10	* DJ
72-55-9	4,4'-DDE	0.33 0.30	* DEJ
60-57-1	Dieldrin	0.18 0.18	* DJ
72-54-8	4,4'-DDD	0.11	
5103-73-1	cis-Nonachlor	0.042	J
50-29-3	4,4'-DDT	0.033	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40181F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216165
Date Received: 10/08/93
Date Extracted: 04/27/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.059	JN
1024-57-3	Heptachlor Epoxide	0.058	
5103-74-2	gamma-Chlordane	0.020	
5103-71-9	alpha-Chlordane	0.013	J
30765-80-5	trans-Nonachlor	0.013	
72-55-9	4,4'-DDE	0.12	
60-57-1	Dieldrin	0.015	
72-54-8	4,4'-DDD	0.030	
5103-73-1	cis-Nonachlor	0.020	J
50-29-3	4,4'-DDT	0.016	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40182F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216167
Date Received: 10/08/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.062	Y
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0087	JN
58-89-9	gamma-BHC	0.010 0.0050	UJ
309-00-2	Aldrin	0.023	JN
1024-57-3	Heptachlor Epoxide	0.029	J
5103-74-2	gamma-Chlordane	0.042	
5103-71-9	alpha-Chlordane	0.060	
39765-80-5	trans-Nonachlor	0.063	
72-55-9	4,4'-DDE	0.27 0.25	X DJ
60-57-1	Dieldrin	0.13	
72-54-8	4,4'-DDD	0.095	
5103-73-1	cis-Nonachlor	0.30	
50-29-3	4,4' DDT	0.035	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40183F

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216169
Date Received: 10/08/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.060	
1024-57-3	Heptachlor Epoxide	0.053	
5103-74-2	gamma-Chlordane	0.028	
5103-71-9	alpha-Chlordane	0.017	
39765-80-5	trans-Nonachlor	0.032	
72-55-9	4,4'-DDE	0.55 0.45	X DJ
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.069	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4' DDT	0.044	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40184F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216171
Date Received: 10/08/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.13	Y
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.045	JN
1024-57-3	Heptachlor Epoxide	0.036	
5103-74-2	gamma-Chlordane	0.020	
5103-71-9	alpha-Chlordane	0.010	
38765-80-5	trans-Nonachlor	0.014	
72-55-9	4,4'-DDE	0.13	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.025	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.022	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40185F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216173
Date Received: 10/08/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.054	Y J
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.11	JN
1024-57-3	Heptachlor Epoxide	0.10	
5103-74-2	gamma-Chlordane	0.052	
5103-71-9	alpha-Chlordane	0.026	
39765-80-5	trans-Nonachlor	0.042	
72-55-9	4,4'-DDE	0.33 0.33	X DJ
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.069	
5103-73-1	cis-Nonachlor	0.0050	U
50-28-3	4,4'-DDT	0.047	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40186F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216175
Date Received: 10/08/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.053	JN
1024-57-3	Heptachlor Epoxide	0.041	
5103-74-2	gamma-Chlordane	0.022	
5103-71-9	alpha-Chlordane	0.011	
30765-80-5	trans-Nonachlor	0.016	
72-55-9	4,4'-DDE	0.13	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.031	
5103-73-1	cis-Nonachlor	0.023	J
50-28-3	4,4' DDT	0.019	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40187F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216177
Date Received: 10/08/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
300-00-2	Aldrin	0.042	
1024-57-3	Heptachlor Epoxide	0.031	
5103-74-2	gamma-Chlordane	0.038 0.034	DJN
5103-71-9	alpha-Chlordane	0.018	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.30 0.27	* DJ
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.032	
5103-73-1	cis-Nonachlor	0.0050	U
50-28-3	4,4' DDT	0.050	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

K40188F

SDG: 39955

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 216179
 Date Received: 10/08/93
 Date Extracted: 04/08/94
 Date Analyzed: 05/18/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.088	* E J N
1024-57-3	Heptachlor Epoxide	0.079	
5103-74-2	gamma-Chlordane	0.048	
5103-71-9	alpha-Chlordane	0.026	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.34 0.30	* DEJ
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.058	
5103-73-1	cis-Nonachlor	0.0050	U
50-28-3	4,4' DDT	0.057	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40189F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39955

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 216181
 Date Received: 10/08/93
 Date Extracted: 04/08/94
 Date Analyzed: 05/18/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.055	
1024-57-3	Heptachlor Epoxide	0.064 0.060	DJN
5103-74-2	gamma-Chlordane	0.023	
5103-71-9	alpha-Chlordane	0.0050	UJ
39765-80-5	trans-Nonachlor	0.024 0.024	DJ
72-55-9	4,4'-DDE	0.22 0.22	* DJ
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.038	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4' DDT	0.031	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u>	Client ID No. <div style="border: 1px solid black; padding: 5px; text-align: center;">K40258F</div>
Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	SDG: <u>39955</u> Lab Sample ID: <u>216187</u> Date Received: <u>10/13/93</u> Date Extracted: <u>04/08/94</u> Date Analyzed: <u>05/18/94</u> Sulfur Clean-up: <u>N</u>

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.15 0.13	X DJ
1024-57-3	Heptachlor Epoxide	0.076	
5103-74-2	gamma-Chlordane	0.049	JN
5103-71-9	alpha-Chlordane	0.038	
39765-80-5	trans-Nonachlor	0.010 0.053	UDJ
72-55-9	4,4'-DDE	0.32 0.20	* DEJ
60-57-1	Dieldrin	0.046	JN
72-54-8	4,4'-DDD	0.15	
5103-73-1	cis-Nonachlor	0.051	
50-29-3	4,4' DDT	0.045	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40259F

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216189
Date Received: 10/13/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.022	J
1024-57-3	Heptachlor Epoxide	0.016	
5103-74-2	gamma-Chlordane	0.012 0.011	DJN
5103-71-9	alpha-Chlordane	0.011	J
39765-80-5	trans-Nonachlor	0.010 0.011	UJD
72-55-9	4,4'-DDE	0.17 0.17	*DJ
60-57-1	Dieldrin	0.015	JN
72-54-8	4,4'-DDD	0.069	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4' DDT	0.026	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40260F

SDG: 39955

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 216191
Date Received: 10/13/93
Date Extracted: 04/08/94
Date Analyzed: 05/18/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.034	J
1024-57-3	Heptachlor Epoxide	0.026	
5103-74-2	gamma-Chlordane	0.010 0.010	UDJ
5103-71-9	alpha-Chlordane	0.013	
39765-80-5	trans-Nonachlor	0.011	J
72-55-9	4,4'-DDE	0.23 0.22	X DJ
60-57-1	Dieldrin	0.035	
72-54-8	4,4'-DDD	0.092	
5103-73-1	cis-Nonachlor	0.0065	
50-29-3	4,4'-DDT	0.024	JN
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

K40261F

SDG: 39955

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 216193
 Date Received: 10/13/93
 Date Extracted: 04/08/94
 Date Analyzed: 05/18/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.036	JN
1024-57-3	Heptachlor Epoxide	0.014	
5103-74-2	gamma-Chlordane	0.018	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.012	J
72-55-9	4,4'-DDE	0.075	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.014	J
5103-73-1	cis-Nonachlor	0.024	
50-29-3	4,4'-DDT	0.018	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40262F

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 39955Lab Sample ID: 216195Date Received: 10/13/93Date Extracted: 04/08/94Date Analyzed: 05/18/94Sulfur Clean-up: NPhase Type: BiotaPhase Weight: 10.0 gExtraction: SoxhletDilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.057	J
1024-57-3	Heptachlor Epoxide	0.045	J
5103-74-2	gamma-Chlordane	0.028	
5103-71-9	alpha-Chlordane	0.015	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.34 0.22	X DJ
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.049	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4' DDT	0.051	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

R

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

The CRDL standard recovery was above acceptable limits. No data fell in the affected range; therefore, no sample qualification was necessary.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was below acceptable limits. All data have been qualified as estimated based on the deviation.

4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u> </u>	<u> </u>
Sample No.?	<u>X</u>	<u> </u>	<u> </u>
SDG No.?	<u>X</u>	<u> </u>	<u> </u>
Correct units?	<u>X</u>	<u> </u>	<u> </u>
Matrix?	<u>X</u>	<u> </u>	<u> </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u> </u>	<u> </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u> </u>	<u> </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u> </u>	<u> </u>
Is the distillation log for cyanides present?	<u> </u>	<u> </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u> </u>	<u> </u>
Are the measurement read out records present for:			
ICP	<u> </u>	<u> </u>	<u>X</u>
Flame AA	<u> </u>	<u> </u>	<u>X</u>
Furnace AA	<u> </u>	<u> </u>	<u>X</u>
Mercury	<u>X</u>	<u> </u>	<u> </u>
Cyanides	<u> </u>	<u> </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u> </u>	<u> </u>
Is the data properly labeled?	<u>X</u>	<u> </u>	<u> </u>
<u>Holding Times</u>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u> </u>	<u> </u>

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Form I (Final Data)			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Calibration</u>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form II A (Initial and Continuing Calibration Verification)</u>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)			X
<u>Form III (Initial and Continuing Calibration Blanks)</u>			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
<u>Form III (Preparation Blank)</u>			
Was one prep. blank analyzed for:			
each Sample Delivery Group (SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form IV (ICP Interference Check Sample)</u>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ($\pm 20\%$)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form VI (Lab Duplicates)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		X	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
<u>Form VII (Laboratory Control Sample)</u>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCs "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<u>Form IX (ICP Serial Dilution)</u>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
\geq 100%?			X
<u>Furnace Atomic Absorption (AA) QC Analysis</u>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form VIII (Method of Standard Addition Results)</u>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Field Blank</u>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X, XI, XII (Verification of Instrumental Parameters)</u>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X (Instrument Detection Limits)</u>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u> </u>	<u> X </u>	<u> </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher linear range of ICP.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u> </u>	<u> X </u>	<u> </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u> </u>	<u> </u>	<u> X </u>

Corrected Sample Analysis Data Sheets

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40169F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39955

Matrix (soil/water): FISH Lab Sample ID: 216157

Level (low/med): LOW Date Received: 10/07/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40170F

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39955 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 216159

Level (low/med): LOW _____

Date Received: 10/07/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09		✓ N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40179F

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39955 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 216161

Level (low/med): LOW _____ Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08		JN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40180F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39955

Matrix (soil/water): FISH Lab Sample ID: 216163

Level (low/med): LOW Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.10		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40181F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39955

Matrix (soil/water): FISH Lab Sample ID: 216165

Level (low/med): LOW Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.23		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40182F

Lab Name: AQUATEC _____ Contract: 91082 _____
Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39955 _____
Matrix (soil/water): FISH _____ Lab Sample ID: 216167
Level (low/med): LOW _____ Date Received: 10/08/93
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.09	-	N	CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____
Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40183F

Sample Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39955 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 216169

Level (low/med): LOW _____ Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.22		UN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40184F

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39955_

Matrix (soil/water): FISH_ Lab Sample ID: 216171

Level (low/med): LOW_ Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.20		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40185F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39955

Matrix (soil/water): FISH Lab Sample ID: 216173

Level (low/med): LOW Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40186F

Lab Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39955

Matrix (soil/water): FISH

Lab Sample ID: 216175

Level (low/med): LOW

Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.16		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before: .

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40187F

Site Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39955

Matrix (soil/water): FISH Lab Sample ID: 216177

Level (low/med): LOW Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.26		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40188F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39955

Matrix (soil/water): FISH Lab Sample ID: 216179

Level (low/med): LOW Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.20		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40189F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39955

Matrix (soil/water): FISH Lab Sample ID: 216181

Level (low/med): LOW Date Received: 10/08/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.21		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40258F

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39955 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 216187

Level (low/med): LOW _____

Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.17		N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40259F

Lab Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39955

Matrix (soil/water): FISH

Lab Sample ID: 216189

Level (low/med): LOW

Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.07		IN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40260F

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39955 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 216191

Level (low/med): LOW _____ Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05		UN	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40261F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39955

Matrix (soil/water): FISH Lab Sample ID: 216193

Level (low/med): LOW Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.26		✓N	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40262F

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39955 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 216195

Level (low/med): LOW _____

Date Received: 10/13/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.11	-	5N	CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	Fillet Weight	% Lipids	
				Fillet	Remaining Carcass
K40169	Carp	female	2670g	20.2	24.7
K40170	Carp	female	2323g	24.8	28.3
K40179	Carp	male	1625g	10.1	19.0
K40180	Carp	female	2760g	22.2	31.5
K40181	Carp	female	907g	6.75	7.2
K40182	Carp	female	1404g	17.9	25.9
K40183	Carp	female	789g	4.90	4.80
K40184	Carp	male	584g	2.37	7.10
K40185	Carp	male	642g	6.96	10.3
K40186	Carp	female	434g	3.95	11.4
K40187	Carp	male	512g	2.66	10.1
K40188	Carp	male	454g	7.50	8.20
K40189	Carp	female	318g	4.23	8.00
K40258	Carp	male	751g	2.50	5.47
K40259	Carp	female	782g	4.91	8.49
K40260	Carp	male	833g	7.67	19.4
K40261	Carp	female	891g	0.95	2.91
K40262	Carp	male	682g	7.83	22.0

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# 39962

PCB, PESTICIDE AND
MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 39962 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	%Lipid
K40196F	215250	bass	fillet	Near Saugatuck	x	x
K40196R	215251	bass	carcass	Near Saugatuck		x
K40197F	215252	bass	fillet	Near Saugatuck	x	x
K40197R	215253	bass	carcass	Near Saugatuck		x
K40198F	215254	bass	fillet	Near Saugatuck	x	x
K40198R	215255	bass	carcass	Near Saugatuck		x
K40199F	215256	bass	fillet	Near Saugatuck	x	x
K40199R	215257	bass	carcass	Near Saugatuck		x
K40200F	215258	bass	fillet	Near Saugatuck	x	x
K40200R	215259	bass	carcass	Near Saugatuck		x
K40213F	215260	bass	fillet	Near Saugatuck	x	x
K40213R	215261	bass	carcass	Near Saugatuck		x
K40214F	215262	bass	fillet	Near Saugatuck	x	x
K40214R	215263	bass	carcass	Near Saugatuck		x
K40215F	215264	bass	fillet	Near Saugatuck	x	x
K40215R	215265	bass	carcass	Near Saugatuck		x
K40216F	215266	bass	fillet	Near Saugatuck	x	x
K40216R	215267	bass	carcass	Near Saugatuck		x
K40243F	215268	bass	fillet	Battle Creek	x	x
K40243R	215269	bass	carcass	Battle Creek		x
K40246F	215270	bass	fillet	Battle Creek	x	x
K40246R	215271	bass	carcass	Battle Creek		x
K40247F*	215272	bass	fillet	Battle Creek	x	x
K40247R	215273	bass	carcass	Battle Creek		x
K40375F	215365	bass	fillet	Morrow Pond	x	x
K40385R	215366	bass	carcass	Morrow Pond		x
K40387F	215367	bass	fillet	Morrow Pond	x	x
K40387R	215368	bass	carcass	Morrow Pond		x

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB/ Hg	%Lipid
K40388F	215369	bass	fillet	Morrow Pond	x	x
K40388R	215370	bass	carcass	Morrow Pond		x
K40389F	215371	bass	fillet	Morrow Pond	x	x
K40389R	215372	bass	carcass	Morrow Pond		x
K40390F	215373	bass	fillet	Morrow Pond	x	x
K40390R	215374	bass	carcass	Morrow Pond		x

* MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40213F, K40214F, K40215F, K40247F, K40247FMS, and K40247FMSD. No qualifiers were added to the samples based on the surrogate recovery. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. All matrix spike blank recoveries were also within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Instrument Blanks	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u> </u>	<u> </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40196F	OK for all samples		OK		OK
K40197F					
K40198F					
K40199F					
K40200F					
K40213F		↓ (57)		↓ (58)	
K40214F		↓ (58)		↓ (57)	
K40215F		↓ (57)		↓ (56)	
K40216F					
K40243F					
K40246F					
K40247F		↓ (59)		↓ (58)	
K40247FMS		↓ (56)		↓ (58)	
K40247FMSD		↓ (58)			
K40375F					
K40387F					
K40388F					
K40389F					
K40390F					

Surrogate Standards

TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2087
 Column: RTX-35 / RTX-5

Date:	5/1/94 2255	5/2	5/2	5/3	5/3	5/3	5/3
Time:	to 5/2/94 1916	2028	2103	0414	0450	1200	1236
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	5.7 / 4.0		1.0				
Aroclor 1221	6.4 / 3.4						
Aroclor 1232	4.1 / 2.5						
Aroclor 1242	4.6 / 4.2				5.5		
Aroclor 1248	5.1 / 4.5	0.5		1.0		1.0	
Aroclor 1254	4.9 / 4.8						7.0
Aroclor 1260	3.6 / 3.0						
Tetrachloro-m-xylene	6.6 / 4.5						
Decachlorobiphenyl	6.5 / 8.5						
Affected Samples:							

PCB Calibration Summary - Page 2

Instrument: HP2087
 Column: RTX-35 / RTX-5

Date:		5/3	5/3	5/4	5/4		
Time:		1948	2024	0335	0411		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016					6.5		
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		3.5		9.5			
Aroclor 1254							
Aroclor 1260			4.0				
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40196F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215250

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.26	
11097-69-1	Aroclor-1254	0.19	
11096-82-5	Aroclor-1260	0.028	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40197F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215252

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.27	
11097-69-1	Aroclor-1254	0.21	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40198F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215254

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.35	
11097-69-1	Aroclor-1254	0.24	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40199F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215256

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.27	
11097-69-1	Aroclor-1254	0.17	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40200F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215258

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/30/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.20	
11097-69-1	Aroclor-1254	0.27	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40213F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215260

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.038	J
11097-69-1	Aroclor-1254	0.24	
11096-82-5	Aroclor-1260	0.033	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40214F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215262

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.48	
11096-82-5	Aroclor-1260	0.096	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40215F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215264

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.10	
11096-82-5	Aroclor-1260	0.030	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40216F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215266

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.79	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40243F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215268

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.049	J
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40246F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215270

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.10	
11096-82-5	Aroclor-1260	0.038	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40247F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215272

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.064	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40375F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215365

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.40	
11097-69-1	Aroclor-1254	0.22	
11096-82-5	Aroclor-1260	0.058	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40387F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215367

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/26/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.10	
11096-82-5	Aroclor-1260	0.039	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40388F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215369

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.10	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCLOL ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40389F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215371

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.15	
11096-82-5	Aroclor-1260	0.089	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40390F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Phase Type: BIOTA

Lab Sample ID: 215373

Phase Weight: 10.0 (g)

Date Received: 10/16/93

Injection Volume: 1.0 (uL)

Date Extracted: 03/31/94

Dilution Factor: 1.0

Date Analyzed: 05/03/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.46	
11096-82-5	Aroclor-1260	0.097	

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exception:

Instrument HP2404, RTX-5 5/18/94 07:36

2-Bromobiphenyl 27.1%

All data for this compound have been qualified as estimated in the associated samples K40247FMSDL and K40247FMSDDL.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40196F	Aldrin	60.0%
	4,4'-DDE	27.8%
K40197F	Aldrin	80.0%
	4,4'-DDE	30.8%
K40198F	Aldrin	87.5%
	4,4'-DDE	28.6%
K41994F	Aldrin	100.0%
K40200F	Aldrin	100.0%
	4,4'-DDE	28.6%
K40213F	Aldrin	86.4%
	4,4'-DDE	26.7%
K40214F	Aldrin	83.3%
	trans-Nonachlor	48.1%
	cis-Nonachlor	182.1%
K40216F	Aldrin	146.2%
	gamma-Chlordane	77.4%
	cis-Nonachlor	29.3%
K40247F	4,4'-DDE	53.8%
K40390F	trans-Nonachlor	49.1%
	cis-Nonachlor	38.0%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries for Aldrin were high in both the matrix spike and matrix spike duplicate samples. The elevated recoveries were most likely due to positive interference from PCBs present in the samples. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers have been added to the samples based on matrix spike performance.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are the surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u> </u>	<u> </u>	<u>X</u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u> </u>	<u>X</u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
Were the method blanks reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 2 </u> out of <u> 8 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
<u>Blanks</u>			
Is the method blank summary form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	X		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
Is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?		X	
Is Form VII-2 present and complete for each mid-point standard analyzed?	X		
Are RPD values for all compounds < 25%?	X		
<u>Analytical Sequence Check</u>			
Is Form VIII present and complete for each column and each period of analyses?	X		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u> </u>	<u> </u>
Are all samples listed on the form?	<u>X</u>	<u> </u>	<u> </u>
If GPC cleanup was performed, is Form IX-2 present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u> </u>	<u> </u>
GPC calibration (80-110%)	<u> </u>	<u> </u>	<u>X</u>
<u>Pesticide/PBB Identification</u>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u> </u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u> </u>	<u>X</u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

Pesticide/PBB Qualifier Summary
Holding Time and Surrogates

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40196F	OK for all samples	OK	OK	OK	OK
K40197F					
K40198F					
K40199F					
K40200F					
K40213F					
K40214F					
K40215F					
K40216F					
K40243F					
K40246F					
K40247F					
K40247FMS					
K40247FMSD					
K40375F					
K40387F					
K40388F					
K40389F					
K40390F					

TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

D Surrogate diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: HP2404

Column: RTX-5

Date:	4/26/94	5/2	5/3	5/3	5/3		
Time:	20:30	22:28	06:47	15:08	23:29		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404

Column: RTX-35

Date:	4/26/94	5/2	5/3	5/3	5/3		
Time:	20:30	22:28	06:47	15:08	23:29		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404
 Column: RTX-5

Date:	5/17/94	5/18					
Time:	17:19	07:36					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	27.1					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:		K40247 FMSDL					
		K40247 FMSDDL					

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404
 Column: RTX-35

Date:	5/17/94	5/18					
Time:	17:19	07:36					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Corrected Sample Analysis Data Sheets

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40196F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Lab Sample ID: 215250

Date Received: 10/09/93

Date Extracted: 03/30/94

Date Analyzed: 05/02/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.010	JN
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.018	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40197F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39962

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215252
Date Received: 10/09/93
Date Extracted: 03/30/94
Date Analyzed: 05/02/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.010	JN
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.013	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

K40198F

SDG: 39962

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215254
 Date Received: 10/09/93
 Date Extracted: 03/30/94
 Date Analyzed: 05/03/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0096	JN
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.014	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40199F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39962

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215256
 Date Received: 10/09/93
 Date Extracted: 03/30/94
 Date Analyzed: 05/03/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.012	
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.020	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40200F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39962

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215258
 Date Received: 10/09/93
 Date Extracted: 03/30/94
 Date Analyzed: 05/03/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0080	
1024-57-3	Heptachlor Epoxide	0.0071	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.014	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40213F

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 39962Lab Sample ID: 215260Date Received: 10/12/93Date Extracted: 03/31/94Date Analyzed: 05/03/94Sulfur Clean-up: NPhase Type: BiotaPhase Weight: 10.0 gExtraction: SoxhletDilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0059	JN
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.015	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40214F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39962

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215262
Date Received: 10/12/93
Date Extracted: 03/31/94
Date Analyzed: 05/03/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.022	JN
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0081	J
72-55-9	4,4'-DDE	0.063	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0067	
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40215F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39962

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215264
Date Received: 10/12/93
Date Extracted: 03/31/94
Date Analyzed: 05/03/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.013	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40216F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39962

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215266
Date Received: 10/12/93
Date Extracted: 03/31/94
Date Analyzed: 05/03/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.013	
1024-57-3	Heptachlor Epoxide	0.012	
5103-74-2	gamma-Chlordane	0.0062	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.049	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0075	J
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40243F

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 39962Lab Sample ID: 215268Date Received: 10/12/93Date Extracted: 03/31/94Date Analyzed: 05/03/94Sulfur Clean-up: NPhase Type: BiotaPhase Weight: 10.0 gExtraction: SoxhletDilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40246F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39962

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215270
 Date Received: 10/12/93
 Date Extracted: 03/31/94
 Date Analyzed: 05/03/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.027	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40247F

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39962

Lab Sample ID: 215272

Date Received: 10/12/93

Date Extracted: 03/31/94

Date Analyzed: 05/03/94

Sulfur Clean-up: N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.016	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: <u>Aquatec, Inc.</u> Lab Code: <u>AQUAI</u> Contract: <u>91082</u> Case: <u>BIO</u>	Client ID No. <div style="border: 1px solid black; padding: 5px; text-align: center; width: fit-content; margin: 5px auto;">K40375F</div> SDG: <u>39962</u>
Phase Type: <u>Biota</u> Phase Weight: <u>10.0 g</u> Extraction: <u>Soxhlet</u> Dilution Factor: <u>1.0</u>	Lab Sample ID: <u>215365</u> Date Received: <u>10/16/93</u> Date Extracted: <u>03/31/94</u> Date Analyzed: <u>05/03/94</u> Sulfur Clean-up: <u>N</u>

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.012	
1024-57-3	Heptachlor Epoxide	0.010	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.013	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40387F

SDG: 39962

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215367
Date Received: 10/16/93
Date Extracted: 03/31/94
Date Analyzed: 05/03/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.016	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40388F

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39962

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215369
Date Received: 10/16/93
Date Extracted: 03/31/94
Date Analyzed: 05/03/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.011	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40389F

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39962

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 215371
 Date Received: 10/16/93
 Date Extracted: 03/31/94
 Date Analyzed: 05/03/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.017	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40390F

SDG: 39962

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 215373
Date Received: 10/16/93
Date Extracted: 03/31/94
Date Analyzed: 05/03/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0057	J
72-55-9	4,4'-DDE	0.056	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	J
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

CRDL standard recovery was slightly above acceptable limits. No data fell in the affected range; therefore, no data qualification was necessary.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was slightly below acceptable limits. All data have been qualified as estimated based on the deviation.

4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was outside specified limits. No qualifiers have been added to the samples based on the RPD.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u> </u>	<u> </u>
Sample No.?	<u>X</u>	<u> </u>	<u> </u>
SDG No.?	<u>X</u>	<u> </u>	<u> </u>
Correct units?	<u>X</u>	<u> </u>	<u> </u>
Matrix?	<u>X</u>	<u> </u>	<u> </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u> </u>	<u> </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u> </u>	<u> </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u> </u>	<u> </u>
Is the distillation log for cyanides present?	<u> </u>	<u> </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u> </u>	<u> </u>
Are the measurement read out records present for:			
ICP	<u> </u>	<u> </u>	<u>X</u>
Flame AA	<u> </u>	<u> </u>	<u>X</u>
Furnace AA	<u> </u>	<u> </u>	<u>X</u>
Mercury	<u>X</u>	<u> </u>	<u> </u>
Cyanides	<u> </u>	<u> </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u> </u>	<u> </u>
Is the data properly labeled?	<u>X</u>	<u> </u>	<u> </u>
<u>Holding Times</u>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u> </u>	<u> </u>

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Form I (Final Data)			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Calibration</u>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form II A (Initial and Continuing Calibration Verification)</u>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)?			X
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			X
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			X
Is concentration of prep. blank below the negative CRDL?		X	
<u>Form IV (ICP Interference Check Sample)</u>			
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits ($\pm 20\%$)?			X
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?			X
<u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u>			
Present and complete for:			
each SDG?	X		
each matrix type?	X		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?		X	
If no, is sample concentration greater than or equal to four times spike concentration?		X	
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	X		
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?	X		
between 126-200%?		X	
greater than 200%?		X	
<u>Form VI (Lab Duplicates)</u>			
Present and complete for:			
each SDG?	X		

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?		X	
If no, are all results outside the control limits flagged with an * on Form I's and VI?	X		
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		X	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
<u>Form VII (Laboratory Control Sample)</u>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<u>Form IX (ICP Serial Dilution)</u>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
\geq 100%?			X
<u>Furnace Atomic Absorption (AA) QC Analysis</u>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form VIII (Method of Standard Addition Results)</u>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Field Blank</u>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X, XI, XII (Verification of Instrumental Parameters)</u>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X (Instrument Detection Limits)</u>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	_____	<u> X </u>	_____
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	_____	_____	<u> X </u>
Was any sample result higher linear range of ICP.	_____	_____	<u> X </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	_____	<u> X </u>	_____
If yes for any of the above, was the sample diluted to obtain the result on Form I?	_____	_____	<u> X </u>

Corrected Sample Analysis Data Sheets

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40196F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39962

Matrix (soil/water): FISH

Lab Sample ID: 215250

Level (low/med): LOW

Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04		J N*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40197F

Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39962 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 215252

Level (low/med): LOW _____ Date Received: 10/09/93

‡ Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.12		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40198F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39962

Matrix (soil/water): FISH

Lab Sample ID: 215254

Level (low/med): LOW

Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.07		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40199F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39962

Matrix (soil/water): FISH Lab Sample ID: 215256

Level (low/med): LOW Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.06		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40200F

Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39962 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 215258

Level (low/med): LOW _____

Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40213F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39962

Matrix (soil/water): FISH

Lab Sample ID: 215260

Level (low/med): LOW

Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40214F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39962

Matrix (soil/water): FISH

Lab Sample ID: 215262

Level (low/med): LOW

Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.07		J N*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40215F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39962

Matrix (soil/water): FISH Lab Sample ID: 215264

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.33		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40216F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39962

Matrix (soil/water): FISH Lab Sample ID: 215266

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.19		N*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40243F

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39962

Matrix (soil/water): FISH Lab Sample ID: 215268

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40246F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39962

Matrix (soil/water): FISH

Lab Sample ID: 215270

Level (low/med): LOW

Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.07		N*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40247F

Name: AQUATEC _____ Contract: 91082 _____
Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39962 _____
Matrix (soil/water): FISH _____ Lab Sample ID: 215272
Level (low/med): LOW _____ Date Received: 10/12/93
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.08		5 N*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____
Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40375F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39962

Matrix (soil/water): FISH Lab Sample ID: 215365

Level (low/med): LOW Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.15		JN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40387F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39962

Matrix (soil/water): FISH Lab Sample ID: 215367

Level (low/med): LOW Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40388F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39962

Matrix (soil/water): FISH

Lab Sample ID: 215369

Level (low/med): LOW

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.13		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40389F

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39962

Matrix (soil/water): FISH Lab Sample ID: 215371

Level (low/med): LOW Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.09		IN*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40390F

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39962

Matrix (soil/water): FISH

Lab Sample ID: 215373

Level (low/med): LOW

Date Received: 10/16/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.07		✓ N*	CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	Fillet Weight	% Lipids	
				Fillet	Body
K40196	Small Mouth Bass	male	154g	1.37	8.80
K40197	Small Mouth Bass	male	106g	0.52	4.50
K40198	Small Mouth Bass	female	107g	0.94	11.3
K40199	Small Mouth Bass	female	93g	0.80	9.80
K40200	Small Mouth Bass	male	88g	0.69	3.00
K40213	Small Mouth Bass	male	131g	0.66	4.00
K40214	Small Mouth Bass	male	102g	1.06	7.00
K40215	Small Mouth Bass	female	264g	0.73	5.50
K40216	Small Mouth Bass	male	417g	0.73	5.00
K40243	Small Mouth Bass	female	228g	1.02	6.20
K40246	Small Mouth Bass	female	266g	1.99	7.00
K40247	Small Mouth Bass	male	240g	0.82	3.90
K40375	Small Mouth Bass	female	167g	0.81	3.65
K40387	Small Mouth Bass	female	142g	0.55	2.05
K40388	Small Mouth Bass	female	133g	0.49	2.54
K40389	Small Mouth Bass	male	103g	0.58	1.00
K40390	Small Mouth Bass	male	111g	1.41	3.05

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# 39963

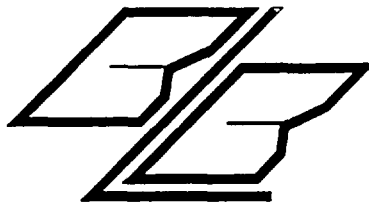
PCB, PESTICIDE AND
MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 39963 for the Blota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					Pest/PCB /Hg	%Lipid
K40217W	200491	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40218W	200492	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40219W	200493	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40220W	200494	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40221W	200495	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40222W	200496	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40223W	200497	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40224W	200498	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40225W	200499	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40226W*	200500	Spotted Sucker	whole body	Below Allegan Dam	x	x
K40227W	215501	Spotted Sucker	whole body	Below Allegan Dam	x	x

- * MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in sample K40223W. All data for this sample have been qualified as estimated due to the deviation. Surrogate recoveries were below acceptable control limits for one surrogate in samples K40217W, K40218W, K40219W, K40220W, K40222, WK40225W, K40226W, and K40226WMSD. No qualifiers have been added to these samples based on surrogate recovery. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. All matrix spike blank recoveries were also within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Instrument Blanks	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u> </u>	<u> </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40217W	OK for all samples	↓ (46)		↓ (48)	
K40218W		↓ (54)		↓ (55)	
K40219W		↓ (52)		↓ (53)	
K40220W		↓ (58)			
K40221W					
K40222W		↓ (59)			
K40223W		↓ (45)	↓ (51)	↓ (46)	↓ (51)
K40224W					
K40225W		↓ (58)		↓ (58)	
K40226W		↓ (58)		↓ (59)	
K40226WMS					
K40226WMSD		↓ (59)			
K40227W					

Surrogate Standards

TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:	5/10/94 1845	5/11	5/12	5/12	5/12	5/16	5/16
Time:	to 5/11/94 1334	2327	0000	0640	0713	1430	1503
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.6 / 4.6		8.5				
Aroclor 1221	3.9 / 3.9						
Aroclor 1232	3.2 / 3.7						
Aroclor 1242	2.7 / 2.8				2.5		
Aroclor 1248	3.2 / 2.7	2.0		3.0		2.0	
Aroclor 1254	2.8 / 2.8						
Aroclor 1260	3.5 / 2.7						1.5
Tetrachloro-m-xylene	4.9 / 3.6						
Decachlorobiphenyl	8.6 / 9.2						
Affected Samples:							

PCB Calibration Summary - Page 2

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:		5/16	5/16				
Time:		2122	2155				
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016			7.0				
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		1.0					
Aroclor 1254							
Aroclor 1260							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40217W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200491

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/16/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.083	
11096-82-5	Aroclor-1260	0.051	

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40218W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200492

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/16/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.18	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.17	
11096-82-5	Aroclor-1260	0.068	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40219W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200493

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/16/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.26	
11097-69-1	Aroclor-1254	0.22	
11096-82-5	Aroclor-1260	0.050	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40220W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200494

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/16/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.030	J
11097-69-1	Aroclor-1254	0.068	
11096-82-5	Aroclor-1260	0.039	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40221W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200495

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.25	
11096-82-5	Aroclor-1260	0.031	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40222W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200496

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.64	
11097-69-1	Aroclor-1254	0.28	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40223W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200497

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U J
11104-28-2	Aroclor-1221	0.050	U J
11141-16-5	Aroclor-1232	0.050	U J
53469-21-9	Aroclor-1242	0.050	U J
12672-29-6	Aroclor-1248	0.050	U J
11097-69-1	Aroclor-1254	0.15	J
11096-82-5	Aroclor-1260	0.022	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40224W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200498

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.066	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.17	
11096-82-5	Aroclor-1260	0.030	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40225W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200499

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.031	J
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.17	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40226W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200500

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.12	
11096-82-5	Aroclor-1260	0.047	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40227W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39963

Phase Type: BIOTA

Lab Sample ID: 200501

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/12/94

Dilution Factor: 1.0

Date Analyzed: 05/12/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.15	
11097-69-1	Aroclor-1254	0.43	
11096-82-5	Aroclor-1260	0.050	U

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in samples K40217W, K40219W, K40220W, K40221W, K40222W, K40223W, K40224W, K40225W and K40226W. All data for these samples have been qualified as estimated due to the deviation. Recoveries were below control limits for one surrogate in samples K40218W K40226WMS, K40226WMSD, and K40227W. No qualifiers have been added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40218W	4,4'-DDE	30.8%
K40219W	Heptachlor Epoxide	60.0%
	4,4'-DDE	31.3%
	cis-Nonachlor	292.2%
K40222W	4,4'-DDE	40.0%
	cis-Nonachlor	265.1%
K40227W	cis-Nonachlor	263.6%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent differences (RPDs) between recoveries were within acceptable control limits. All recoveries in the matrix spike blank were also within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are the surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
Were the method blanks reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 8 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
<u>Blanks</u>			
Is the method blank summary form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any trip/field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	<u>X</u>	<u> </u>	<u> </u>
performance evaluation mixtures (BCS)	<u>X</u>	<u> </u>	<u> </u>
Toxaphene multipoint calibration	<u>X</u>	<u> </u>	<u> </u>
Pesticide/PBB multipoint calibration	<u>X</u>	<u> </u>	<u> </u>
Pesticide/PBB mid-point standard	<u>X</u>	<u> </u>	<u> </u>
instrument blanks	<u>X</u>	<u> </u>	<u> </u>
Are Forms VI 1-4 present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	<u>X</u>	<u> </u>	<u> </u>
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u>X</u>	<u> </u>	<u> </u>
Is Form VII-1 present for each BCS analyzed for both columns?	<u>X</u>	<u> </u>	<u> </u>
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT	<u> </u>	<u>X</u>	<u> </u>
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	<u> </u>	<u>X</u>	<u> </u>
Is Form VII-2 present and complete for each mid-point standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are RPD values for all compounds < 25%?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Is Form VIII present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u> </u>	<u> </u>
Are all samples listed on the form?	<u>X</u>	<u> </u>	<u> </u>
If GPC cleanup was performed, is Form IX-2 present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u> </u>	<u> </u>
GPC calibration (80-110%)	<u> </u>	<u> </u>	<u>X</u>
<u>Pesticide/PBB Identification</u>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u> </u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u> </u>	<u>X</u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

Pesticide/PBB Qualifier Summary
Holding Time and Surrogates

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40217W	OK for all samples	↓ (48)	↓ (51)	↓ (42)	OK
K40218W		↓ (48)		↓ (45)	
K40219W		↓ (48)	↓ (56)	↓ (43)	
K40220W		↓ (48)	↓ (56)	↓ (45)	
K40221W		↓ (48)	↓ (58)	↓ (40)	
K40222W		↓ (48)	↓ (59)	↓ (43)	
K40223W		↓ (48)	↓ (55)	↓ (40)	
K40224W		↓ (48)	↓ (59)	↓ (47)	
K40225W		↓ (48)	↓ (55)	↓ (39)	
K40226W		↓ (48)	↓ (54)	↓ (38)	
K40226WMS				↓ (44)	
K40226WMSD				↓ (38)	
K40227W		↓ (48)		↓ (40)	

TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

D Surrogate diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: HP2618
 Column: RTX-5

Date:	5/18/94	5/19					
Time:	22:43	12:07					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2618
 Column: RTX-35

Date:	5/18/94	5/19					
Time:	22:43	12:07					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 3

Instrument: HP2404

Column: RTX-5

Date:	5/19/94	5/20					
Time:	22:08	11:31					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 4

Instrument: HP2404
 Column: RTX-35

Date:	5/19/94	5/20					
Time:	22:08	11:31					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Corrected Sample Analysis Data Sheets

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40217W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39963

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200491
Date Received: 10/12/93
Date Extracted: 04/12/94
Date Analyzed: 05/19/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.010	U J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0050	U J
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40218W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39963

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200492
Date Received: 10/12/93
Date Extracted: 04/12/94
Date Analyzed: 05/19/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0058	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.013	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40219W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39963

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200493
Date Received: 10/12/93
Date Extracted: 04/12/94
Date Analyzed: 05/19/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.0050	UJ
1024-57-3	Heptachlor Epoxide	0.0075	JN
5103-74-2	gamma-Chlordane	0.0050	UJ
5103-71-9	alpha-Chlordane	0.0050	UJ
39765-80-5	trans-Nonachlor	0.0050	UJ
72-55-9	4,4'-DDE	0.016	JN
60-57-1	Dieldrin	0.010	UJ
72-54-8	4,4'-DDD	0.010	UJ
5103-73-1	cis-Nonachlor	0.0051	
50-29-3	4,4'-DDT	0.010	UJ
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	UJ

R

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40220W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39963

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200494
Date Received: 10/12/93
Date Extracted: 04/12/94
Date Analyzed: 05/19/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.010	U J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0050	U J
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40221W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39963

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200495
Date Received: 10/12/93
Date Extracted: 04/12/94
Date Analyzed: 05/19/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.013	U J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0050	U J
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40222W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39963

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200496
Date Received: 10/12/93
Date Extracted: 04/12/94
Date Analyzed: 05/19/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.019	J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0063	
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40223W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39963

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200497
 Date Received: 10/12/93
 Date Extracted: 04/12/94
 Date Analyzed: 05/19/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.013	J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0050	U J
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40224W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39963

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200498
Date Received: 10/12/93
Date Extracted: 04/12/94
Date Analyzed: 05/19/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.010	U J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0050	U J
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40225W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39963

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200499
 Date Received: 10/12/93
 Date Extracted: 04/12/94
 Date Analyzed: 05/19/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.010	U J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0050	U J
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40226W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39963

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200500
Date Received: 10/12/93
Date Extracted: 04/12/94
Date Analyzed: 05/20/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.012	U J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0050	U J
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40227W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39963

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200501
 Date Received: 10/12/93
 Date Extracted: 04/12/94
 Date Analyzed: 05/20/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.016	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0055	
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

4.2 Laboratory Duplicate

The difference between laboratory duplicates was within specified limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u> </u>	<u> </u>
Sample No.?	<u>X</u>	<u> </u>	<u> </u>
SDG No.?	<u>X</u>	<u> </u>	<u> </u>
Correct units?	<u>X</u>	<u> </u>	<u> </u>
Matrix?	<u>X</u>	<u> </u>	<u> </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u> </u>	<u> </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u> </u>	<u> </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u> </u>	<u> </u>
Is the distillation log for cyanides present?	<u> </u>	<u> </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u> </u>	<u> </u>
Are the measurement read out records present for:			
ICP	<u> </u>	<u> </u>	<u>X</u>
Flame AA	<u> </u>	<u> </u>	<u>X</u>
Furnace AA	<u> </u>	<u> </u>	<u>X</u>
Mercury	<u>X</u>	<u> </u>	<u> </u>
Cyanides	<u> </u>	<u> </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u> </u>	<u> </u>
Is the data properly labeled?	<u>X</u>	<u> </u>	<u> </u>
<u>Holding Times</u>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u> </u>	<u> </u>

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Form I (Final Data)			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Calibration</u>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form II A (Initial and Continuing Calibration Verification)</u>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)			X
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form IV (ICP Interference Check Sample)</u>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ($\pm 20\%$)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form VI (Lab Duplicates)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?			X
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?		X	
<u>Form VII (Laboratory Control Sample)</u>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCs "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<u>Form IX (ICP Serial Dilution)</u>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
\geq 100%?			X
<u>Furnace Atomic Absorption (AA) QC Analysis</u>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form VIII (Method of Standard Addition Results)</u>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Field Blank</u>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X, XI, XII (Verification of Instrumental Parameters)</u>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X (Instrument Detection Limits)</u>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u> </u>	<u> X </u>	<u> </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher linear range of ICP.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u> </u>	<u> X </u>	<u> </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u> </u>	<u> </u>	<u> X </u>

Corrected Sample Analysis Data Sheets

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40217W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39963 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200491

Level (low/med): LOW _____ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40218W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39963

Matrix (soil/water): FISH Lab Sample ID: 200492

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40219W

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39963

Matrix (soil/water): FISH

Lab Sample ID: 200493

Level (low/med): LOW

Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40220W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39963

Matrix (soil/water): FISH Lab Sample ID: 200494

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40221W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39963

Matrix (soil/water): FISH Lab Sample ID: 200495

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40222W

Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39963 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200496

Level (low/med): LOW _____ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.04	-		CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40223W

Name: AQUATEC

Contract: 91082

Lab Code: AQUAI

Case No.: BIO

SAS No.:

SDG No.: 39963

Matrix (soil/water): FISH

Lab Sample ID: 200497

Level (low/med): LOW

Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40224W

Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39963

Matrix (soil/water): FISH Lab Sample ID: 200498

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40225W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39963

Matrix (soil/water): FISH Lab Sample ID: 200499

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40226W

Lab Name: AQUATEC Contract: 91082
Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39963
Matrix (soil/water): FISH Lab Sample ID: 200500
Level (low/med): LOW Date Received: 10/12/93
% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:
Color After: Clarity After: Artifacts:
Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40227W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39963

Matrix (soil/water): FISH Lab Sample ID: 200501

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	% Lipids
K40217	Spotted Sucker	male	0.88
K40218	Spotted Sucker	male	1.08
K40219	Spotted Sucker	male	1.11
K40220	Spotted Sucker	male	1.07
K40221	Spotted Sucker	male	0.99
K40222	Spotted Sucker	male	0.83
K40223	Spotted Sucker	male	1.66
K40224	Spotted Sucker	male	0.54
K40225	Spotted Sucker	male	1.16
K40226	Spotted Sucker	female	0.81
K40227	Spotted Sucker	male	0.85

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# 39976

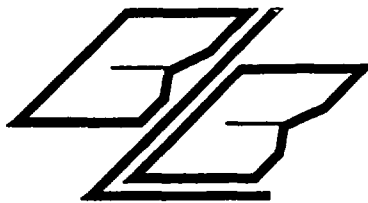
PCB, PESTICIDE AND
MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data packages for SDG# 39976 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

Sample ID	Lab ID	Species	Description	Sample Location	Analysis	
					PCB	%Lipid
K40211W	200200	White Sucker	whole body	Near Saugatuck	x	x
K40212W	200201	White Sucker	whole body	Near Saugatuck	x	x
K40228W	200512	White Sucker	whole body	Battle Creek	x	x
K40229W	200513	White Sucker	whole body	Battle Creek	x	x
K40230W	200514	White Sucker	whole body	Battle Creek	x	x
K40231W	200515	White Sucker	whole body	Battle Creek	x	x
K40232W	200516	White Sucker	whole body	Battle Creek	x	x
K40233W*	200517	White Sucker	whole body	Battle Creek	x	x
K40234W	200518	White Sucker	whole body	Battle Creek	x	x
K40235W	200519	White Sucker	whole body	Battle Creek	x	x
K40236W	200520	White Sucker	whole body	Battle Creek	x	x
K40237W	200521	White Sucker	whole body	Battle Creek	x	x
K40238W	200522	White Sucker	whole body	Battle Creek	x	x
K40328W	201576	White Sucker	whole body	Trowbridge	x	x
K40329W	201577	White Sucker	whole body	Trowbridge	x	x
K40330W	201578	White Sucker	whole body	Trowbridge	x	x
K40331W	201579	White Sucker	whole body	Trowbridge	x	x
K40332W	201580	White Sucker	whole body	Trowbridge	x	x

* MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in sample K40228W. All data for this sample have been qualified as estimated due to the deviation. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. All matrix spike blank recoveries were also within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Instrument Blanks	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>	<u> </u>	<u> </u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40211W	OK for all samples				
K40212W					
K40228W		↓ (41)	↓ (48)	↓ (42)	↓ (49)
K40229W					
K40230W					
K40231W					
K40232W					
K40233W					
K40233WMS					
K40233WMSD					
K40234W					
K40235W					
K40236W					
K40237W					
K40238W					
K40328W					
K40329W					
K40330W					
K40331W					
K40332W					

Surrogate Standards
 TCX Tetrachloro-*m*-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 ↑ Recovery high
 ↓ Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:	5/10/94 1845	5/14	5/14	5/14	5/14	5/14	5/14
Time:	to 5/11/94 1334	0123	0156	0835	0908	1547	1620
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016	4.6 / 4.6						8.0
Aroclor 1221	3.9 / 3.9						
Aroclor 1232	3.2 / 3.7						
Aroclor 1242	2.7 / 2.8						
Aroclor 1248	3.2 / 2.7	3.0		4.0		3.5	
Aroclor 1254	2.8 / 2.8		1.0				
Aroclor 1260	3.5 / 2.7				0.5		
Tetrachloro-m-xylene	4.9 / 3.6						
Decachlorobiphenyl	8.6 / 9.2						
Affected Samples:							

PCB Calibration Summary - Page 2

Instrument: HP2618
 Column: RTX-35 / RTX-5

Date:		5/14	5/15	5/16	5/16	5/16	5/16
Time:		2153	2226	0930	1003	1430	1503
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232							
Aroclor 1242			7.0				
Aroclor 1248		4.5		4.5		2.0	
Aroclor 1254					4.0		
Aroclor 1260							1.5
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40211W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200200

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.77	
11097-69-1	Aroclor-1254	0.46	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40212W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200201

Phase Weight: 10.0 (g)

Date Received: 10/09/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.36	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.74	
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40228W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200512

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U J
11104-28-2	Aroclor-1221	0.050	U J
11141-16-5	Aroclor-1232	0.050	U J
53469-21-9	Aroclor-1242	0.050	U J
12672-29-6	Aroclor-1248	0.050	U J
11097-69-1	Aroclor-1254	0.050	U J
11096-82-5	Aroclor-1260	0.050	U J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40229W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200513

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.056	
11096-82-5	Aroclor-1260	0.034	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40230W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200514

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.096	
11096-82-5	Aroclor-1260	0.031	J

FORM 1
AROCLOL ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40231W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200515

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	
11096-82-5	Aroclor-1260	0.030	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40232W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200516

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.11	
11096-82-5	Aroclor-1260	0.033	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40233W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200517

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.043	J
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40234W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200518

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.036	J
11096-82-5	Aroclor-1260	0.021	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40235W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200519

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.028	J
11096-82-5	Aroclor-1260	0.050	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40236W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200520

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.045	J
11096-82-5	Aroclor-1260	0.022	J

FORM 1
AROCOLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40237W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200521

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/16/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.053	
11096-82-5	Aroclor-1260	0.024	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40238W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 200522

Phase Weight: 10.0 (g)

Date Received: 10/12/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.048	J
11096-82-5	Aroclor-1260	0.027	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40328W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 201576

Phase Weight: 10.0 (g)

Date Received: 10/15/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.48	
11096-82-5	Aroclor-1260	0.067	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40329W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 201577

Phase Weight: 10.0 (g)

Date Received: 10/15/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 1.0

Date Analyzed: 05/14/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.12	
11097-69-1	Aroclor-1254	0.091	
11096-82-5	Aroclor-1260	0.030	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40330W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 201578

Phase Weight: 10.0 (g)

Date Received: 10/15/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/16/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.92	
11096-82-5	Aroclor-1260	0.094	J

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40331W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 201579

Phase Weight: 10.0 (g)

Date Received: 10/15/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/16/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.84	
11096-82-5	Aroclor-1260	0.12	

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40332W

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

SDG: 39976

Phase Type: BIOTA

Lab Sample ID: 201580

Phase Weight: 10.0 (g)

Date Received: 10/15/93

Injection Volume: 1.0 (uL)

Date Extracted: 04/14/94

Dilution Factor: 2.0

Date Analyzed: 05/16/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.72	
11096-82-5	Aroclor-1260	0.14	

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in sample K40228W. All data for this sample have been qualified as estimated due to the deviation. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40211W	Aldrin	68.2%
	gamma-Chlordane	144.2%
	4,4'-DDE	29.8%
K40212W	Aldrin	107.4%
	gamma-Chlordane	98.4%
K40328W	Aldrin	61.5%
	Heptachlor Epoxide	46.2%
	4,4'-DDE	40.6%
K40329W	Aldrin	63.0%
	Heptachlor Epoxide	44.5%
	gamma-Chlordane	50.8%
	4,4'-DDE	38.1%
K40330W	Aldrin	29.6%
	Heptachlor Epoxide	58.3%
K40331W	Aldrin	72.4%
	gamma-Chlordane	60.8%
	4,4'-DDE	35.1%
K40332W	Aldrin	59.9%
	Heptachlor Epoxide	2793.9%
	gamma-Chlordane	99.4%
	4,4'-DDE	47.1%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries for Aldrin were above the acceptable control limit in the matrix spike and matrix spike duplicate samples. All other recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. Matrix spike recoveries were within acceptable control limits for the matrix spike blank (MSB) sample. No qualifiers have been added to the samples based on matrix spike performance.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the samples numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are the surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Are the outliers correctly marked with an asterisk?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
Were the method blanks reanalyzed?	<u> </u>	<u> </u>	<u>X</u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>2</u> out of <u>8</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>0</u> out of <u>4</u>			
<u>Blanks</u>			
Is the method blank summary form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	<u>X</u>	<u> </u>	<u> </u>

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any trip/field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u>X</u>	<u> </u>
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present for all samples, blanks, and MS/MSD?			
peak resolution check	<u>X</u>	<u> </u>	<u> </u>
performance evaluation mixtures (BCS)	<u>X</u>	<u> </u>	<u> </u>
Toxaphene multipoint calibration	<u>X</u>	<u> </u>	<u> </u>
Pesticide/PBB multipoint calibration	<u>X</u>	<u> </u>	<u> </u>
Pesticide/PBB mid-point standard	<u>X</u>	<u> </u>	<u> </u>
instrument blanks	<u>X</u>	<u> </u>	<u> </u>
Are Forms VI 1-4 present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	<u>X</u>	<u> </u>	<u> </u>
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u>X</u>	<u> </u>	<u> </u>
Is Form VII-1 present for each BCS analyzed for both columns?	<u>X</u>	<u> </u>	<u> </u>
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT	<u> </u>	<u>X</u>	<u> </u>
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	<u>X</u>	<u> </u>	<u> </u>
Is Form VII-2 present and complete for each mid-point standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are RPD values for all compounds < 25%?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Is Form VIII present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>X</u>	<u> </u>	<u> </u>
Are all samples listed on the form?	<u>X</u>	<u> </u>	<u> </u>
If GPC cleanup was performed, is Form IX-2 present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	<u>X</u>	<u> </u>	<u> </u>
GPC calibration (80-110%)	<u> </u>	<u> </u>	<u>X</u>
<u>Pesticide/PBB Identification</u>			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u>X</u>	<u> </u>	<u> </u>
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u>X</u>
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?	<u> </u>	<u>X</u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u>X</u>	<u> </u>
<u>Field Duplicates</u>			
Where field duplicates submitted with the samples?	<u> </u>	<u>X</u>	<u> </u>

Pesticide/PBB Qualifier Summary
Holding Time and Surrogates

Sample ID	Holding Time	Surrogates - Column 1		Surrogates - Column 2	
		TCX	DCB	TCX	DCB
K40211W	OK for all samples				
K40212W					
K40228W		↓ (51)	↓ (51)	↓ (49)	↓ (50)
K40229W					
K40230W					
K40231W					
K40232W					
K40233W					
K40233WMS					
K40233WMSD					
K40234W					
K40235W					
K40236W					
K40237W					
K40238W					
K40328W					
K40329W					
K40330W					
K40331W					
K40332W					

TCX Tetrachloro-m-xylene
DCB Decachlorobiphenyl

D Surrogate diluted out
↑ Recovery high
↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: HP2404
 Column: RTX-5

Date:	5/17/94	5/22	5/22	5/23	5/23		
Time:	17:19	10:29	20:52	05:11	09:57		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Pesticide/PBB Calibration Summary - Page 2

Instrument: HP2404

Column: RTX-35

Date:	5/17/94	5/22	5/22	5/23	5/23		
Time:	17:19	10:29	20:52	05:11	16:22		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptachlor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							

Corrected Sample Analysis Data Sheets

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40211W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200200Date Received: 10/09/93Date Extracted: 04/14/94Date Analyzed: 05/22/94Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.026	JN
1024-57-3	Heptachlor Epoxide	0.031	
5103-74-2	gamma-Chlordane	0.0077	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.031	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40212W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200201
 Date Received: 10/09/93
 Date Extracted: 04/14/94
 Date Analyzed: 05/22/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.015	
1024-57-3	Heptachlor Epoxide	0.019	
5103-74-2	gamma-Chlordane	0.0063	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.029	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40228W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200512
 Date Received: 10/12/93
 Date Extracted: 04/14/94
 Date Analyzed: 05/22/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U J
2113-57-7	3-Bromobiphenyl	0.010	U J
92-66-0	4-Bromobiphenyl	0.010	U J
118-74-1	Hexachlorobenzene	0.0050	U J
58-89-9	gamma-BHC	0.0050	U J
309-00-2	Aldrin	0.0050	U J
1024-57-3	Heptachlor Epoxide	0.0050	U J
5103-74-2	gamma-Chlordane	0.0050	U J
5103-71-9	alpha-Chlordane	0.0050	U J
39765-80-5	trans-Nonachlor	0.0050	U J
72-55-9	4,4'-DDE	0.010	U J
60-57-1	Dieldrin	0.010	U J
72-54-8	4,4'-DDD	0.010	U J
5103-73-1	cis-Nonachlor	0.0050	U J
50-29-3	4,4'-DDT	0.010	U J
36355-01-8	Hexabromobiphenyl	0.020	U J
8001-35-2	Toxaphene	0.20	U J

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40229W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39976

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200513
Date Received: 10/12/93
Date Extracted: 04/14/94
Date Analyzed: 05/22/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.015	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40230W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200514
 Date Received: 10/12/93
 Date Extracted: 04/14/94
 Date Analyzed: 05/22/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.036	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40231W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200515
 Date Received: 10/12/93
 Date Extracted: 04/14/94
 Date Analyzed: 05/22/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.010	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40232W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200516
 Date Received: 10/12/93
 Date Extracted: 04/14/94
 Date Analyzed: 05/22/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.041	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.018	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40233W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200517
 Date Received: 10/12/93
 Date Extracted: 04/14/94
 Date Analyzed: 05/22/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.014	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40234W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39976

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200518
Date Received: 10/12/93
Date Extracted: 04/14/94
Date Analyzed: 05/23/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.010	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40235W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39976

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 200519
Date Received: 10/12/93
Date Extracted: 04/14/94
Date Analyzed: 05/23/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.010	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40236W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200520
 Date Received: 10/12/93
 Date Extracted: 04/14/94
 Date Analyzed: 05/23/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.010	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40237W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 200521
 Date Received: 10/12/93
 Date Extracted: 04/14/94
 Date Analyzed: 05/23/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.011	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40238W

Lab Name: Aquatec, Inc.Lab Code: AQUAIContract: 91082Case: BIOSDG: 39976Lab Sample ID: 200522Date Received: 10/12/93Date Extracted: 04/14/94Date Analyzed: 05/23/94Sulfur Clean-up: NPhase Type: BiotaPhase Weight: 10.0 gExtraction: SoxhletDilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40328W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39976

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 201576
Date Received: 10/15/94
Date Extracted: 04/14/94
Date Analyzed: 05/23/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0091	U
1024-57-3	Heptachlor Epoxide	0.0052	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.017	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40329W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 201577
 Date Received: 10/15/94
 Date Extracted: 04/14/94
 Date Analyzed: 05/23/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.014	JN
1024-57-3	Heptachlor Epoxide	0.0090	J
5103-74-2	gamma-Chlordane	0.0066	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.029	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40330W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 201578
 Date Received: 10/15/94
 Date Extracted: 04/14/94
 Date Analyzed: 05/23/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0065	J
1024-57-3	Heptachlor Epoxide	0.0050	JN
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.010	U
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40331W

Lab Name: Aquatec, Inc.
 Lab Code: AQUAI
 Contract: 91082
 Case: BIO

SDG: 39976

Phase Type: Biota
 Phase Weight: 10.0 g
 Extraction: Soxhlet
 Dilution Factor: 1.0

Lab Sample ID: 201579
 Date Received: 10/15/94
 Date Extracted: 04/14/94
 Date Analyzed: 05/23/94
 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.011	JN
1024-57-3	Heptachlor Epoxide	0.011	
5103-74-2	gamma-Chlordane	0.0061	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.028	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1
PESTICIDE, PBB ANALYSIS DATA SHEET

Client ID No.

K40332W

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

SDG: 39976

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 201580
Date Received: 10/15/94
Date Extracted: 04/14/94
Date Analyzed: 05/23/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.012	JN
1024-57-3	Heptachlor Epoxide	0.0090	
5103-74-2	gamma-Chlordane	0.0051	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.022	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

4.2 Laboratory Duplicate

The difference between laboratory duplicates was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u>X</u>	<u> </u>	<u> </u>
Sample No.?	<u>X</u>	<u> </u>	<u> </u>
SDG No.?	<u>X</u>	<u> </u>	<u> </u>
Correct units?	<u>X</u>	<u> </u>	<u> </u>
Matrix?	<u>X</u>	<u> </u>	<u> </u>
Raw Data			
Is the digestion log for flame AA/ICP present?	<u> </u>	<u> </u>	<u>X</u>
Is the digestion log for furnace AA present?	<u> </u>	<u> </u>	<u>X</u>
Is the distillation log for mercury present?	<u>X</u>	<u> </u>	<u> </u>
Is the distillation log for cyanides present?	<u> </u>	<u> </u>	<u>X</u>
Are preparation dates present on sample preparation logs/bench sheets?	<u>X</u>	<u> </u>	<u> </u>
Are the measurement read out records present for:			
ICP	<u> </u>	<u> </u>	<u>X</u>
Flame AA	<u> </u>	<u> </u>	<u>X</u>
Furnace AA	<u> </u>	<u> </u>	<u>X</u>
Mercury	<u>X</u>	<u> </u>	<u> </u>
Cyanides	<u> </u>	<u> </u>	<u>X</u>
Is the data legible?	<u>X</u>	<u> </u>	<u> </u>
Is the data properly labeled?	<u>X</u>	<u> </u>	<u> </u>
<u>Holding Times</u>			
Were mercury analyses performed within 28 days?	<u>X</u>	<u> </u>	<u> </u>

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were other metal analysis performed within 6 months?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Form I (Final Data)			
Are all forms complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are correct units indicated on Form I's?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all "less than IDL" values properly coded with "U"?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the correct concentration qualifiers used with final data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a brief physical description of samples given on Form I's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Calibration</u>			
Is a record of at least 2 point calibration present for ICP analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is a record of 5 point calibration present for Hg analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is a record of 4 point calibration present for:			
Flame AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Furnace AA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cyanides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanide Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atomic Absorption Analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form II A (Initial and Continuing Calibration Verification)</u>			
Present and complete for every metal and cyanide?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hg (80-120 %R)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cyanides (85-115 %R)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)?			X
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL<CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is concentration of prep. blank below the negative CRDL?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form IV (ICP Interference Check Sample)</u>			
Present and complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are all Interference Check Sample results inside the control limits ($\pm 20\%$)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form V A (Spiked Sample Recovery - Pre-Digestion/Pre-Distillation)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
each matrix type?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was field blank used for spiked sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Are all recoveries within control limits (75-125)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If no, is sample concentration greater than or equal to four times spike concentration?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are any spike recoveries:			
less than 10%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 10-74%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
between 126-200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
greater than 200%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Form VI (Lab Duplicates)</u>			
Present and complete for:			
each SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference $\leq \pm$ CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?			X
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?		X	
<u>Form VII (Laboratory Control Sample)</u>			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
<u>Form IX (ICP Serial Dilution)</u>			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
\geq 100%?			X
<u>Furnace Atomic Absorption (AA) QC Analysis</u>			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed by GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was a dilution analyzed for sample with analytical spike recovery less than 40%?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is analytical spike recovery outside the control limits (85-115%) for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form VIII (Method of Standard Addition Results)</u>			
Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If no, is any Form I result coded with "S" or a "+"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.990 for any sample?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was MSA required for any sample but not performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is coefficient of correlation for MSA less than 0.995?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Was proper quantitation procedure followed as outlined in the SOW on page E-23?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Field Blank</u>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If no, was field blank value already rejected due to other QC criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X, XI, XII (Verification of Instrumental Parameters)</u>			
Is verification report present for :			
Instrument Detection Limits (quarterly)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICP Interelement Correlation Factors (annually)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ICP Linear Ranges (quarterly)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Form X (Instrument Detection Limits)</u>			
Are IDLs present for:			
all the analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
all the instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inorganic Data Validation Checklist - Page 7

	YES	NO	NA
Is IDL greater than CRDL for any analyte?	<u> </u>	<u> X </u>	<u> </u>
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher linear range of ICP.	<u> </u>	<u> </u>	<u> X </u>
Was any sample result higher than the highest calibration standard for non-ICP parameters?	<u> </u>	<u> X </u>	<u> </u>
If yes for any of the above, was the sample diluted to obtain the result on Form I?	<u> </u>	<u> </u>	<u> X </u>

Corrected Sample Analysis Data Sheets

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40211W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39976_

Matrix (soil/water): FISH_ Lab Sample ID: 200200

Level (low/med): LOW_ Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40212W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200201

Level (low/med): LOW _____ Date Received: 10/09/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40228W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39976_

Matrix (soil/water): FISH_ Lab Sample ID: 200512

Level (low/med): LOW_ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40229W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200513

Level (low/med): LOW _____ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40230W

Lab Name: AQUATEC_____ Contract: 91082_____

Lab Code: AQUAI_____ Case No.: BIO_____ SAS No.: _____ SDG No.: 39976_____

Matrix (soil/water): FISH_____

Lab Sample ID: 200514

Level (low/med): LOW_____

Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40231W

Lab Name: AQUATEC Contract: 91082

Lab Code: AQUAI Case No.: BIO SAS No.: SDG No.: 39976

Matrix (soil/water): FISH Lab Sample ID: 200515

Level (low/med): LOW Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40232W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200516

Level (low/med): LOW _____ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.03			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40233W

Lab Name: AQUATEC_____ Contract: 91082_____

Lab Code: AQUAI_____ Case No.: BIO_____ SAS No.: _____ SDG No.: 39976_____

Matrix (soil/water): FISH_____ Lab Sample ID: 200517

Level (low/med): LOW_____ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.05	-		CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40234W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 200518

Level (low/med): LOW _____

Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40235W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200519

Level (low/med): LOW _____ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.01	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40236W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 200520

Level (low/med): LOW _____

Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.01	B		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40237W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39976_

Matrix (soil/water): FISH_ Lab Sample ID: 200521

Level (low/med): LOW_ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.01	B		CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40238W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 200522

Level (low/med): LOW _____ Date Received: 10/12/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.01	B		CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40328W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI_ Case No.: BIO_ SAS No.: _____ SDG No.: 39976_

Matrix (soil/water): FISH_ Lab Sample ID: 201576

Level (low/med): LOW_ Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.04	-		CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40329W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 201577

Level (low/med): LOW _____

Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		NR
7440-36-0	Antimony		-		NR
7440-38-2	Arsenic		-		NR
7440-39-3	Barium		-		NR
7440-41-7	Beryllium		-		NR
7440-43-9	Cadmium		-		NR
7440-70-2	Calcium		-		NR
7440-47-3	Chromium		-		NR
7440-48-4	Cobalt		-		NR
7440-50-8	Copper		-		NR
7439-89-6	Iron		-		NR
7439-92-1	Lead		-		NR
7439-95-4	Magnesium		-		NR
7439-96-5	Manganese		-		NR
7439-97-6	Mercury	0.06	-		CV
7440-02-0	Nickel		-		NR
7440-09-7	Potassium		-		NR
7782-49-2	Selenium		-		NR
7440-22-4	Silver		-		NR
7440-23-5	Sodium		-		NR
7440-28-0	Thallium		-		NR
7440-62-2	Vanadium		-		NR
7440-66-6	Zinc		-		NR
	Cyanide		-		NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40330W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____

Lab Sample ID: 201578

Level (low/med): LOW _____

Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.05			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40331W

Lab Name: AQUATEC_____ Contract: 91082_____

Lab Code: AQUAI_____ Case No.: BIO_____ SAS No.: _____ SDG No.: 39976_____

Matrix (soil/water): FISH_____

Lab Sample ID: 201579

Level (low/med): LOW_____

Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.04			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____

Clarity Before: _____

Texture: _____

Color After: _____

Clarity After: _____

Artifacts: _____

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40332W

Lab Name: AQUATEC _____ Contract: 91082 _____

Lab Code: AQUAI _____ Case No.: BIO _____ SAS No.: _____ SDG No.: 39976 _____

Matrix (soil/water): FISH _____ Lab Sample ID: 201580

Level (low/med): LOW _____ Date Received: 10/15/93

% Solids: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-43-9	Cadmium				NR
7440-70-2	Calcium				NR
7440-47-3	Chromium				NR
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron				NR
7439-92-1	Lead				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese				NR
7439-97-6	Mercury	0.02			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Cyanide				NR

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	% Lipids
K40211W	White Sucker	male	3.24
K40212W	White Sucker	male	1.34
K40228W	White Sucker	female	0.83
K40229W	White Sucker	male	0.73
K40230W	White Sucker	male	0.86
K40231W	White Sucker	male	0.78
K40232W	White Sucker	male	1.41
K40233W	White Sucker	male	0.80
K40234W	White Sucker	male	0.73
K40235W	White Sucker	male	0.91
K40236W	White Sucker	male	0.72
K40237W	White Sucker	male	0.73
K40238W	White Sucker	female	0.86
K40328W	White Sucker	female	0.73
K40329W	White Sucker	female	0.71
K40330W	White Sucker	female	0.76
K40331W	White Sucker	male	0.66
K40332W	White Sucker	male	0.85

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH01

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Blasland, Bouck & Lee, Inc.
Syracuse, New York

0006071

Summary

The following is an assessment of the PCB data package for SDG# FISH01 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40500	345205	tissue	10/14/97			x		x
K40502	345207	tissue	10/14/97			x		x
K40503C	345208	tissue	10/14/97			x		x
K40506	345209	tissue	10/14/97			x		x
K40507	345210	tissue	10/14/97			x		x
K40508K	345211	tissue	10/14/97			x		x
K40509	345212	tissue	10/14/97			x		x
K40511	345214	tissue	10/14/97			x		x
K40512	345215	tissue	10/14/97			x		x
K40513	345216	tissue	10/14/97			x		x
K40514	345217	tissue	10/14/97			x		x
K40515	345218	tissue	10/14/97			x		x
K40516	345219	tissue	10/14/97			x		x
K40504-C1	345418	tissue	10/14/97			x		x
K40504-C2	345419	tissue	10/16/97			x		x
K40504-C	345420	tissue	10/14/97			x		x
K40517-C	345421	tissue	10/15/97			x		x
K40518-C	345422	tissue	10/15/97			x		x
K40519-C	345423	tissue	10/15/97			x		x
K40520-C	345424	tissue	10/15/97			x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed beyond the specified holding time. Based on the deviation, all data has been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u> </u>	<u>X</u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u> </u>	<u>X</u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u> X </u>	<u> </u>
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	<u> </u>	<u> </u>	<u> X </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40500	+5		
K40502	+5		
K40503C	+5		
K40506	+5		
K40507	+5		
K40508K	+5		
K40509	+5	D	D
K40511	+5		
K40512	+5		
K40513	+5		
K40514	+5		
K40515	+5		
K40516	+5		
K40504-C1	+5		
K40504-C2	+5		
K40504-C	+5		
K40517-C	+10		
K40518-C	+10		
K40519-C	+10		
K40520-C	+10		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 : Recovery high
 : Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

PCB Calibration Summary - Page 3

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40500

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345205

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 01/31/98

% Solids: 200 *AK* 410 *AK*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	<i>5</i>
11104-28-2	Aroclor-1221	100	<i>5</i>
11141-16-5	Aroclor-1232	100	<i>5</i>
53469-21-9	Aroclor-1242	100	<i>5</i>
12672-29-6	Aroclor-1248	330	<i>5</i>
11097-69-1	Aroclor-1254	450	<i>5</i>
11096-82-5	Aroclor-1260	94	<i>5</i>

RECEIVED
APR 06 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40503C

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH01</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345208</u>	
Phase Weight:	<u>10.0</u> (g)	Date Received:	<u>10/16/97</u>	
Injection Volume:	<u>1.0</u> (uL)	Date Extracted:	<u>12/17/97</u>	
Dilution Factor:	<u>2.0</u>	Date Analyzed:	<u>01/31/98</u>	
% Solids:	<u>100% <i>100% 100%</i></u>	Sulfur Clean-up:	<u>Y</u> (Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	4 5
11104-28-2	Aroclor-1221	100	4 5
11141-16-5	Aroclor-1232	100	4 5
53469-21-9	Aroclor-1242	100	4 5
12672-29-6	Aroclor-1248	100	4 5
11097-69-1	Aroclor-1254	1000	4 5
11096-82-5	Aroclor-1260	97	J

REVISE
APR 06 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40507

Lab Name:	ITS Environmental	Lab Code:	INCHVT	
Contract:	91082	Case:	PCB	SDG: FISH01
Phase Type:	BIOTA	Lab Sample ID:	345210	
Phase Weight:	10.0 (g)	Date Received:	10/16/97	
Injection Volume:	1.0 (uL)	Date Extracted:	12/17/97	
Dilution Factor:	2.0	Date Analyzed:	01/31/98	
% Solids:	100 100 100	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	R 5
11104-28-2	Aroclor-1221	100	R 5
11141-16-5	Aroclor-1232	100	R 5
53469-21-9	Aroclor-1242	100	R 5
12672-29-6	Aroclor-1248	470	R 5
11097-69-1	Aroclor-1254	630	R 5
11096-82-5	Aroclor-1260	180	R 5

REVISE
APR 06 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40509

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345212

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 20.0

Date Analyzed: 01/31/98

% Solids: 200 µg/g

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	1000	# 13
11104-28-2	Aroclor-1221	1000	# 13
11141-16-5	Aroclor-1232	1000	# 13
53469-21-9	Aroclor-1242	3000	# 13
12672-29-5	Aroclor-1248	1000	# 13
11097-69-1	Aroclor-1254	13000	# 13
11096-82-5	Aroclor-1260	1300	# 13

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40512

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345215

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 10.0

Date Analyzed: 01/31/98

% Solids: ~~100~~ 19%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	4 5
11104-28-2	Aroclor-1221	500	4 5
11141-16-5	Aroclor-1232	500	4 5
53469-21-9	Aroclor-1242	500	4 5
12672-29-6	Aroclor-1248	500	4 5
11097-69-1	Aroclor-1254	5200	4 5
11096-82-5	Aroclor-1260	810	4 5

REVISE
APR 06 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40514

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345217

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 01/31/98

% Solids: 10% w/w

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓
11104-28-2	Aroclor-1221	50	✓
11141-16-5	Aroclor-1232	50	✓
53469-21-9	Aroclor-1242	50	✓
12672-29-6	Aroclor-1248	530	✓
11097-69-1	Aroclor-1254	370	✓
11096-82-5	Aroclor-1260	71	✓

REVISI
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40516

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345219

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 01/31/98

% Solids: 100% *all 198*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	4 B
11104-28-2	Aroclor-1221	250	4 B
11141-16-5	Aroclor-1232	250	4 B
53469-21-9	Aroclor-1242	250	4 B
12672-29-6	Aroclor-1248	250	4 B
11097-69-1	Aroclor-1254	2000	4 B
11096-82-5	Aroclor-1260	350	4 B

REVISE
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40517-C

Lab Name: ITS Environmental Lab Code: INCHVT
Contract: 91082 Case: PCB SDG: FISH01
Phase Type: BIOTA Lab Sample ID: 345421
Phase Weight: 10.0 (g) Date Received: 10/18/97
Injection Volume: 1.0 (uL) Date Extracted: 12/17/97
Dilution Factor: 1.0 Date Analyzed: 02/05/98
% Solids: 100% (KAS) Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	F
11104-28-2	Aroclor-1221	50	F
11141-16-5	Aroclor-1232	50	F
53469-21-9	Aroclor-1242	50	F
12672-29-6	Aroclor-1248	50	F
11097-69-1	Aroclor-1254	200	F
11096-82-5	Aroclor-1260	39	J

REVISE
APR 06 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40519-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345423

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/05/98

% Solids: 100%
11/19/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R
11104-28-2	Aroclor-1221	50	R
11141-16-5	Aroclor-1232	50	R
53469-21-9	Aroclor-1242	50	R
12672-29-6	Aroclor-1248	50	R
11097-69-1	Aroclor-1254	230	H
11096-82-5	Aroclor-1260	43	J

REVISE
APR 06 1998

PERCENT LIPID ANALYSES

Percent Lipids Results

[illegible]

CHAIN OF CUSTODY

CHAIN OF CUSTODY RECORD

0000004

PROJ. NO.		PROJECT NAME		NO OF CONTAINERS		<div style="display: flex; justify-content: space-around;"> <div>Whole Fish</div> <div>PLBs (Amber)</div> <div>Lipids</div> </div>						REMARKS		
SAMPLERS: (Signature)														
STA. NO.	DATE	TIME	COORD	ORG	STATION LOCATION									
K 40500	10/14/57	13:20		X	New Richmond - ABSA #11	1	X	X					Fillet and analyze following analytical procedures discussed previously	
K 40501				X										
K 40502				X										
K 40503			X											Analyze whole-body composite as directed above
K 40504			X											Retain for combination w/ additional samples
K 40512				X										Fillet and analyze following analytical procedures discussed previously
K 40513														
K 40514														
K 40515														
K 40516														

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	10/15/57 17:50				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
			10/14/57 09:30		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

COPY & ORIGINAL ON FILE

SDG # F.I.S.T. #

FTR # 107952



BLASLAND & BOUCH
ENGINEERS, P.C.


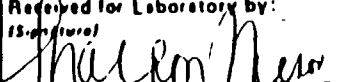
90000

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO OF CON TAINERS	Whole Fish	PLAs (Arollars)	% Lipids							REMARKS
SAMPLERS: (Signature)																
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION											
K10517-L	10/15		X		Juv. & Ad. Sm. fish MORROW Pond - ABSA # 2	1	X	X								Analyze whole body comp. & samples fillet and analyze following analytical procedures discussed previously.
K10518-L	10/15		X													
K10519-L	10/15		X													
K10520-L	10/15		X													
K10521				X	Macro. fish Adult Carp ABSA #2											Fillet and analyze following analytical procedures discussed previously.
K10522																
K10523																
K10524																
K10525																
K10526																
K10527					Macro. fish Adult ABSA #2 Sm. fish											
K10528																
K10529																

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	10/17/97 16:50				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
			10/18/97 1045		

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH02

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH02 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40521	345425	tissue	10/15/97			x		x
K40522	345426	tissue	10/15/97			x		x
K40523*	345427	tissue	10/15/97			x		x
K40525	345429	tissue	10/15/97			x		x
K40526	345430	tissue	10/15/97			x		x
K40527	345431	tissue	10/15/97			x		x
K40528	345432	tissue	10/15/97			x		x
K40529	345433	tissue	10/15/97			x		x
K40530-C	345434	tissue	10/15/97			x		x
K40531-C	345435	tissue	10/16/97			x		x
K40532-C	345436	tissue	10/16/97			x		x
K40533-C	345437	tissue	10/16/97			x		x
K40535	345438	tissue	10/17/97			x		x
K40536	345439	tissue	10/17/97			x		x
K40537	345440	tissue	10/17/97			x		x
K40538	345441	tissue	10/17/97			x		x
K40539	345442	tissue	10/17/97			x		x
K40540	345443	tissue	10/17/97			x		x

* MS/MSD performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples except K40523, K40523MS and K402523MSD were analyzed beyond the specified holding time. Based on the deviation, data for all samples except K40523, K40523MS and K40523MSD have been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u> X </u>	<u> </u>
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	<u> </u>	<u> </u>	<u> X </u>

**PCB Holding Time and Surrogate
Recovery Summary**

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40521	+28		
K40522	+28		
K40523			
K40523MS			
K40523MSD			
K40525	+28		
K40526	+28		
K40527	+28		
K40528	+28		
K40529	+28		
K40530-C	+28		
K40531-C	+28		
K40532-C	+28		
K40533-C	+28		
K40535	+25		
K40536	+25		
K40537	+25		
K40538	+25		
K40539	+25		
K40540	+25		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 : Recovery high
 : Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date:	2/04/98- 2/05/98	2/05/98	2/05/98					
Time:		1308	1335					
	Initial Cal.	Cont. Cal.	Cont. Cal.					
	%RSD	%D	%D					
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok						
Aroclor 1254	ok							
Aroclor 1260	ok							
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

PCB Calibration Summary - Page 3

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40521

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345425

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 300% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	B 5
11104-28-2	Aroclor-1221	50	B 5
11141-16-5	Aroclor-1232	50	B 5
53469-21-9	Aroclor-1242	50	B 5
12672-29-6	Aroclor-1248	50	B 5
11097-69-1	Aroclor-1254	28	J
11096-82-5	Aroclor-1260	33	J

REVISE
APR 07 1998

By Kle

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40523

Lab Name: ITS Environmental

Lab Code: iNCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345427

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 01/16/98

Dilution Factor: 3.0

Date Analyzed: 02/19/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	150	U
11096-82-5	Aroclor-1260	150	U

REVISE
APR 07 1998

By Kfe

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40526

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345430

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 200 ~~g~~ 41148

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	A 13
11104-28-2	Aroclor-1221	50	A 13
11141-16-5	Aroclor-1232	50	A 13
53469-21-9	Aroclor-1242	50	F 13
12672-29-6	Aroclor-1248	50	F 13
11097-69-1	Aroclor-1254	150	4 13
11096-82-5	Aroclor-1260	38	J

REVISE
APR 07 1998

By Kee

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40528

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345432

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100% 417148

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# 13
11104-28-2	Aroclor-1221	50	# 13
11141-16-5	Aroclor-1232	50	# 13
53469-21-9	Aroclor-1242	50	# 13
12672-29-6	Aroclor-1248	50	# 13
11097-69-1	Aroclor-1254	120	# 13
11096-82-5	Aroclor-1260	35	J

REVISE
APR 07 1998

By Kec

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40530-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345434

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/23/98

% Solids: 100% + 1.14%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	✓ 13
11104-28-2	Aroclor-1221	150	✓ 13
11141-16-5	Aroclor-1232	150	✓ 13
53469-21-9	Aroclor-1242	150	✓ 13
12672-29-6	Aroclor-1248	480	✓ 13
11097-69-1	Aroclor-1254	640	✓ 13
11096-82-5	Aroclor-1260	150	✓ 13

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40532-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345436

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/23/98

% Solids: 100% *41% K*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	P <i>5</i>
11104-28-2	Aroclor-1221	150	P <i>5</i>
11141-16-5	Aroclor-1232	150	P <i>5</i>
53469-21-9	Aroclor-1242	150	P <i>5</i>
12672-29-6	Aroclor-1248	560	
11097-69-1	Aroclor-1254	780	
11096-82-5	Aroclor-1260	150	P <i>5</i>

REVISE
APR 07 1998

By *KK*

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40535

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345438

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 02/20/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	# 5
11104-28-2	Aroclor-1221	250	# 5
11141-16-5	Aroclor-1232	250	# 5
53469-21-9	Aroclor-1242	250	# 5
12672-29-6	Aroclor-1248	600	# 5
11097-69-1	Aroclor-1254	700	# 5
11096-82-5	Aroclor-1260	190	J

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40537

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345440

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 02/20/98

% Solids: 200 ~~100~~ 417K8

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	8
11104-28-2	Aroclor-1221	100	4
11141-16-5	Aroclor-1232	100	4
53469-21-9	Aroclor-1242	100	4
12672-29-6	Aroclor-1248	100	4
11097-69-1	Aroclor-1254	350	4
11096-82-5	Aroclor-1260	95	J

REVISED
APR 07 1998

By llk

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40539

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345442

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 02/20/98

% Solids: 100 KK 4/11/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	13
11104-28-2	Aroclor-1221	100	13
11141-16-5	Aroclor-1232	100	13
53469-21-9	Aroclor-1242	100	13
12672-29-6	Aroclor-1248	320	13
11097-69-1	Aroclor-1254	650	13
11096-82-5	Aroclor-1260	100	13

REVISE
APR 07 1998

ITS Environmental 55 South Park Drive Colchester, Vermont 05446

Telephone (802) 655-1203

Fax (802) 655-1248

By KK

PERCENT LIPID ANALYSES

Percent Lipids Results

[illegible]

CHAIN OF CUSTODY



BLAIRLAND & BOUCH
ENGINEERS, P.C.

000003

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CON- TAINERS	Whole Fish	PCAs (Aroclors)	% Lipids						REMARKS
GAS24711		Kalamazee River Resident Fish													
SAMPLERS: (Signature)															
STA. NO.	DATE	TIME	CONT.	GRAB	STATION LOCATION										
K10517-C	10/15		X		10/15/47 16:50 MORRIS Pond - ABSA # 2	1	X	X						Analyze whole body composite samples fillet and analyze following analytical procedures discussed previously.	
K10518-C	10/15		X												
K10519-C	10/15		X												
K10520-C	10/15		X												
K10521				X	10/15/47 16:50 MORRIS Pond Adult Cuck ABSA #2									Fillet and analyze following analytical procedures discussed previously sample (skin-off fillets) SM ASS (Skin-on, scales-on fillets).	
K10522															
K10523															
K10524															
K10525															
K10526															
K10527					10/15/47 16:50 MORRIS Pond Adult Cuck ABSA #2										
K10528															
K10529															
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)					
10/15/47		16:50													
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)					
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks							
				10/18/47		10/15		COPY - ORIGINAL ON FILE SDG # 815101 ETR # 1905							

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH03

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH03 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40542	345446	tissue	10/17/97			x		x
K40543	345447	tissue	10/16/97			x		x
K40544	345448	tissue	10/16/97			x		x
K40545	345449	tissue	10/16/97			x		x
K40546	345450	tissue	10/16/97			x		x
K40547	345451	tissue	10/16/97			x		x
K40548	345452	tissue	10/16/97			x		x
K40549	345453	tissue	10/16/97			x		x
K40550	345454	tissue	10/16/97			x		x
K40552	345510	tissue	10/20/97			x		x
K40553	345511	tissue	10/20/97			x		x
K40554	345512	tissue	10/20/97			x		x
K40555	345513	tissue	10/20/97			x		x
K40556	345514	tissue	10/20/97			x		x
K40557	345515	tissue	10/20/97			x		x
K40568	345516	tissue	10/21/97			x		x
K40569	345517	tissue	10/21/97			x		x
K40570	345518	tissue	10/21/97			x		x
K40571	345519	tissue	10/21/97			x		x
K40572	345520	tissue	10/21/97			x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed beyond the specified holding time. Based on the deviation, all data has been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u> </u>	<u>X</u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u> </u>	<u>X</u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	_____	_____	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	_____	_____
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	_____	_____
Were any electronegative displacement (negative peaks) or unusual peaks detected?	_____	<u> X </u>	_____
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	_____	_____	<u> X </u>

**PCB Holding Time and Surrogate
Recovery Summary**

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40542	+26		
K40543	+26		
K40544	+29		
K40545	+26		
K40546	+26		
K40547	+29		
K40548	+26		
K40549	+26		
K40550	+26		
K40552	+26		
K40553	+26		
K40554	+26		
K40555	+26		
K40556	+25		
K40557	+26		
K40568	+26		
K40569	+26		
K40570	+26		
K40571	+26		
K40572	+26		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 : Recovery high
 : Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40542

Lab Name:	ITS Environmental	Lab Code:	INCHVT	
Contract:	91082	Case:	PCB	SDG: FISH03
Phase Type:	BIOTA	Lab Sample ID:	345446	
Phase Weight:	10.0 (g)	Date Received:	10/18/97	
Injection Volume:	1.0 (uL)	Date Extracted:	12/17/97	
Dilution Factor:	1.0	Date Analyzed:	02/21/98	
% Solids:	<u>100% H7M8</u>	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12574-11-2	Aroclor-1016	50	TT
11104-28-2	Aroclor-1221	50	R
11141-16-5	Aroclor-1232	50	R
53469-21-9	Aroclor-1242	50	R
12672-29-6	Aroclor-1248	250	
11097-69-1	Aroclor-1254	170	
11096-82-5	Aroclor-1260	92	

REVISE
APR 07 1999

By KPC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40544

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345448

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 4.0

Date Analyzed: 02/24/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	200	✓ B
11104-28-2	Aroclor-1221	200	✓ B
11141-16-5	Aroclor-1232	200	✓ B
53469-21-9	Aroclor-1242	200	✓ B
12672-29-6	Aroclor-1248	930	✓ B
11097-69-1	Aroclor-1254	1400	✓ B
11096-82-5	Aroclor-1260	290	✓ B

REVISE
APR 07 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40546

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345450

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% *1748*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# <i>6</i>
11104-28-2	Aroclor-1221	50	# <i>6</i>
11141-16-5	Aroclor-1232	50	# <i>6</i>
53469-21-9	Aroclor-1242	50	# <i>6</i>
12672-29-6	Aroclor-1248	430	# <i>6</i>
11097-69-1	Aroclor-1254	50	# <i>6</i>
11096-82-5	Aroclor-1260	110	# <i>6</i>

REVISE
APR 07 1998

By *KPC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40548

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345452

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% *2/17/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	<i>13</i>
11104-28-2	Aroclor-1221	50	<i>13</i>
11141-16-5	Aroclor-1232	50	<i>13</i>
53469-21-9	Aroclor-1242	240	<i>22</i>
12672-29-6	Aroclor-1248	50	<i>13</i>
11097-69-1	Aroclor-1254	50	<i>13</i>
11096-82-5	Aroclor-1260	110	<i>22</i>

REVISE
APR 07 1998

By *KPC*

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40550

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345454

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 1/3
11104-28-2	Aroclor-1221	50	✓ 1/3
11141-16-5	Aroclor-1232	50	✓ 1/3
53469-21-9	Aroclor-1242	50	✓ 1/3
12672-29-6	Aroclor-1248	270 980	✓ 1/3
11097-69-1	Aroclor-1254	230 50	✓ 1/3
11096-82-5	Aroclor-1260	60 120	✓ 1/3

REVISE
APR 07 1998

By Kll

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40553

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345511

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/17/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# 5
11104-28-2	Aroclor-1221	50	# 5
11141-16-5	Aroclor-1232	50	# 5
53469-21-9	Aroclor-1242	50	# 5
12672-29-6	Aroclor-1248	50	# 5
11097-69-1	Aroclor-1254	87	# 4
11096-82-5	Aroclor-1260	34	J

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40555

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH03</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345513</u>	
Phase Weight:	<u>10.0</u>	(g)	Date Received:	<u>10/23/97</u>
Injection Volume:	<u>1.0</u>	(uL)	Date Extracted:	<u>12/17/97</u>
Dilution Factor:	<u>2.0</u>		Date Analyzed:	<u>02/21/98</u>
% Solids:	<u>100% 4/7/98</u>		Sulfur Clean-up:	<u>Y</u> (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	# 5
11104-28-2	Aroclor-1221	100	# 5
11141-16-5	Aroclor-1232	100	# 5
53469-21-9	Aroclor-1242	100	# 5
12672-29-6	Aroclor-1248	100	# 5
11097-69-1	Aroclor-1254	310	# 4
11096-82-5	Aroclor-1260	80	J

REVISE
APR 07 1998
By Klc

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40557

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345515

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 5
11104-28-2	Aroclor-1221	50	✓ 5
11141-16-5	Aroclor-1232	50	✓ 5
53469-21-9	Aroclor-1242	50	✓ 5
12672-29-6	Aroclor-1248	50	✓ 5
11097-69-1	Aroclor-1254	140	✓ 4
11096-82-5	Aroclor-1260	32	✓ J

REVISE
APR 07 1998

By KAC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40569

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345517

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 02/21/98

% Solids: 100% 4/17/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	H
11104-28-2	Aroclor-1221	250	R
11141-16-5	Aroclor-1232	250	R
53469-21-9	Aroclor-1242	250	R
12672-29-6	Aroclor-1248	250	R
11097-69-1	Aroclor-1254	1400	
11096-82-5	Aroclor-1260	250	J

REVISED
APR 07 1998

By VK

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40571

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345519

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% *AK* *APR*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	<i>R</i> <i>5</i>
11104-28-2	Aroclor-1221	50	<i>R</i> <i>5</i>
11141-16-5	Aroclor-1232	50	<i>R</i> <i>5</i>
53469-21-9	Aroclor-1242	50	<i>R</i> <i>5</i>
12672-29-6	Aroclor-1248	150	<i>R</i> <i>5</i>
11097-69-1	Aroclor-1254	370	<i>R</i> <i>5</i>
11096-82-5	Aroclor-1260	47	<i>J</i>

REVISED
APR 07 1998

By *AK*

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result
K40542	345446	tissue	0.4%
K40543	345447	tissue	1.4%
K40544	345448	tissue	0.3%
K40545	345449	tissue	0.8%
K40546	345450	tissue	0.7%
K40547	345451	tissue	0.6%
K40548	345452	tissue	0.3%
K40549	345453	tissue	0.7%
K40550	345454	tissue	0.7%
K40552	345510	tissue	0.4%
K40553	345511	tissue	0.2%
K40554	345512	tissue	1.0%
K40555	345513	tissue	0.6%
K40556	345514	tissue	0.8%
K40557	345515	tissue	0.3%
K40568	345516	tissue	0.4%
K40569	345517	tissue	1.1%
K40570	345518	tissue	0.3%
K40571	345519	tissue	0.3%
K40572	345520	tissue	0.4%

CHAIN OF CUSTODY



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

000004

PROJ. NO.		PROJECT NAME				Whole Fish		Number of Containers		RBC (Analog)		B Lipids		REMARKS	
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION										
K 40504-C2	10/11/97	14:00	X		New Richmond ABSA #11 Juvenile SM Bass	1	X	X						Combine K40504-C2 with K40504-C1 (provided earlier)	
K 40530-C														Process all Juvenile bass composite samples as	
K 40531-C														whole-body composites and analyze following analytical	
K 40532-C														procedures discussed previously.	
K 40533-C	10/11/97	16:00	X		Lake Mago ABSA #9 Juvenile SM Bass										
K 40534-C1	"	"	"		"									* Retain C-1 to combine with 40534-C2 which will allow	
K 40535	10/17/97	10:00	X		Lake Allegan ABSA #9 Adult Carp	1	X	X						Fillet carp (skin-off fillets) and bass (skin-on,	
K 40536														scales-on fillets) and analyze fillets following	
K 40537														analytical procedures discussed previously.	
K 40538															
K 40539															
K 40540					Lake Allegan ABSA #9 Adult Bass										
K 40541															
K 40542															
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)		
Relinquished by: (Signature)					10/17/97	16:30									
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)		
Relinquished by: (Signature)															
Relinquished by: (Signature)					DATE	TIME	Received for Laboratory by: (Signature)		DATE		TIME		Remarks		
Relinquished by: (Signature)							Sharon Meyer		10/18/97		16:15		COPY - ORIGINAL ON FILE		

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH04

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH04 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40573	345521	tissue	10/21/97			x		x
K40574	345522	tissue	10/21/97			x		x
K40551-C	345523	tissue	10/20/97			x		x
K40564-C	345524	tissue	10/21/97			x		x
K40565-C	345525	tissue	10/21/97			x		x
K40566-C	345526	tissue	10/21/97			x		x
K40567-C	345527	tissue	10/21/97			x		x
K40558	345528	tissue	10/20/97			x		x
K40559	345529	tissue	10/20/97			x		x
K40560	345530	tissue	10/20/97			x		x
K40561	345531	tissue	10/20/97			x		x
K40562	345532	tissue	10/20/97			x		x
K40563	345533	tissue	10/20/97			x		x
K40575	345534	tissue	10/21/97			x		x
K40576	345535	tissue	10/21/97			x		x
K40577	345536	tissue	10/21/97			x		x
K40578	345537	tissue	10/21/97			x		x
K40579	345538	tissue	10/21/97			x		x
K40580	345539	tissue	10/21/97			x		x
K40582	345540	tissue	10/21/97			x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u> X </u>	<u> </u>
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	<u> </u>	<u> </u>	<u> X </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40573			
K40574			
K40551-C			
K40564-C			
K40565-C			
K40566-C			
K40567-C			
K40558			
K40559			
K40560			
K40561			
K40562			
K40563			
K40575			
K40576			
K40577			
K40578			
K40579			
K40580			
K40582			

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 : Recovery high
 : Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40574

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345522

Phase Weight: 10.3 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	130	
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	53	

REVIS
APR 08 1998

By KPC

ITS Environmental 55 South Park Drive Colchester, Vermont 05446

Telephone (802) 655-1203

Fax (802) 655-1248

00001

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40564-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345524

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 5.0

Date Analyzed: 03/05/98

% Solids: 100% 418 K8

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	U
11104-28-2	Aroclor-1221	250	U
11141-16-5	Aroclor-1232	250	U
53469-21-9	Aroclor-1242	250	U
12672-29-6	Aroclor-1248	950	
11097-69-1	Aroclor-1254	640	
11096-82-5	Aroclor-1260	220	J

REVISIT
APR 08 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40566-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345526

Phase Weight: 10.1 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 3.0

Date Analyzed: 03/05/98

% Solids: 100 *KL* 4/5/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	670	
11097-69-1	Aroclor-1254	660	
11096-82-5	Aroclor-1260	170	

REVISE
APR 08 1998

By *KL*

000054

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40558

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345528

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 300 *KL* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	72	
11096-82-5	Aroclor-1260	50	U

REVISE
APR 08 1998

By *KPC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40560

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345530

Phase Weight: 10.2 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 *KL* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	49	U
11097-69-1	Aroclor-1254	78	
11096-82-5	Aroclor-1260	49	U

REVISIT
APR 08 1998

KL
000090

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40562

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345532

Phase Weight: 10.1 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% KA 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	44	J
11096-82-5	Aroclor-1260	50	U

REVISE
APR 08 1998
By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40575

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345534

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 3.0

Date Analyzed: 03/05/98

% Solids: 100% KPC 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	150	U

REVISE
APR 08 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40577

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345536

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	140	
11097-69-1	Aroclor-1254	150	
11096-82-5	Aroclor-1260	31	J

REVIS
APR 08 1998

By KPC

ITS Environmental 55 South Park Drive Colchester, Vermont 05446

Telephone (802) 655-1203

Fax (802) 655-1248

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40579

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345538

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 Kk 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	98	
11097-69-1	Aroclor-1254	170	
11096-82-5	Aroclor-1260	33	J

REVISE
APR 08 1998

By Kk

00011

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40581

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345540

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	150	
11097-69-1	Aroclor-1254	160	
11096-82-5	Aroclor-1260	50	U

REVISE
APR 08 1998

By KFC

FORM 1
 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40581MSD

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345540MD

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 10.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	5400	
12672-29-6	Aroclor-1248	500	U
11097-69-1	Aroclor-1254	5500	
11096-82-5	Aroclor-1260	500	U

REVISE
 APR 08 1998

By Klee

ITS Environmental 55 South Park Drive Colchester, Vermont 05446

Telephone (802) 655-1203

Fax (802) 655-1248

00055

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result
K40574	345522	tissue	0.3%
K40551-C	345523	tissue	1.6%
K40564-C	345524	tissue	2.4%
K40565-C	345525	tissue	2.9%
K40566-C	345526	tissue	2.2%
K40567-C	345527	tissue	3.2%
K40558	345528	tissue	0.6%
K40559	345529	tissue	0.2%
K40560	345530	tissue	0.4%
K40561	345531	tissue	0.3%
K40562	345532	tissue	0.4%
K40563	345533	tissue	0.3%
K40575	345534	tissue	0.5%
K40576	345535	tissue	0.6%
K40577	345536	tissue	0.4%
K40578	345537	tissue	0.7%
K40579	345538	tissue	0.3%
K40580	345539	tissue	0.4%
K40582	345540	tissue	0.4%

CHAIN OF CUSTODY



CDG # FISH03 FIR # 67086

000004

[illegible]



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				<div>1.4.16 Fish</div> <div>Number of Containers</div> <div>P.P.s (Anchors)</div> <div>1.4.16</div> <div>000006</div>															
K1524711		Shelburne River NRP Resident Fish																			
SAMPLERS: (Signature)																					
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	REMARKS															
K40518	10/21/97	12:00		X	Lake Allegany SM Bass	1	X	X								Fillet (Stomach, Scales etc) and analyze fillet					
K40577	1	1		1	1	1	1	1								Following analytical procedures discussed					
K40580	1	1		1	1	1	1	1								previously					
K40581	1	1		1	1	1	1	1								1					
Relinquished by: (Signature)						DATE	TIME	Received by: (Signature)				Relinquished by: (Signature)				DATE	TIME	Relinquished by: (Signature)			
Relinquished by: (Signature)						DATE	TIME	Received by: (Signature)				Relinquished by: (Signature)				DATE	TIME	Relinquished by: (Signature)			
Relinquished by: (Signature)						DATE	TIME	Received for Laboratory by: (Signature)				DATE		TIME		Remarks:					
												10-23-97		0930							

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH05

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH05 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40584	345983	tissue	10/23/97			x		x
K40585	345984	tissue	10/23/97			x		x
K40586	345985	tissue	10/23/97			x		x
K40587	345986	tissue	10/23/97			x		x
K40595	345987	tissue	10/23/97			x		x
K40588	345988	tissue	10/23/97			x		x
K40589	345989	tissue	10/23/97			x		x
K40590	345990	tissue	10/23/97			x		x
K40591	345991	tissue	10/23/97			x		x
K40592	345992	tissue	10/23/97			x		x
K40593	345993	tissue	10/23/97			x		x
K40594	345994	tissue	10/23/97			x		x
K40505	345995	tissue	10/14/97			x		x
K40596	345996	tissue	10/14/97			x		x
K40597	345997	tissue	10/14/97			x		x
K40598	345998	tissue	10/14/97			x		x
K40599	345999	tissue	10/14/97			x		x
K40600	346000	tissue	10/14/97			x		x
K40601	346001	tissue	10/14/97			x		x
K60202	346002	tissue	10/14/97			x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed beyond the specified holding time. Based on the deviation, all data has been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for one surrogate was below control limits in samples K40506, K40512 and K40515. Since recoveries for the remaining surrogate were within control limits, no data has been qualified based on the deviations. Recovery for both surrogates were above control limits in the extraction blank. Since surrogate recoveries for all samples associated with the blank were acceptable, no action has been taken based on the deviation. Surrogates were diluted beyond the range of detection in sample K40509. No data has been qualified based on diluted surrogates.

All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u> </u>	<u>X</u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u> </u>	<u>X</u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u> X </u>	<u> </u>
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	<u> </u>	<u> </u>	<u> X </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40500	+5		
K40502	+5		
K40503C	+5		
K40506	+5		
K40507	+5		
K40508K	+5		
K40509	+5	D	D
K40511	+5		
K40512	+5	:	
K40513	+5		
K40514	+5		
K40515	+5	:	
K40516	+5		
K40504-C1	+5		
K40504-C2	+5		
K40504-C	+5		
K40517-C	+10		
K40518-C	+10		
K40519-C	+10		
K40520-C	+10		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 : Recovery high
 : Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date:	1/28/98- 1/29/98	1/30/98	1/30/98	1/31	1/31	1/31	1/31	1/31
Time:		2118	2145	2156	0337	0902	0929	1307
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok		ok		ok		ok
Aroclor 1254	ok				ok			
Aroclor 1260	ok						ok	
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

PCB Calibration Summary - Page 2

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date:	1/28/98- 1/29/98	1/31/98						
Time:		1334						
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok	ok						
Aroclor 1248	ok							
Aroclor 1254	ok							
Aroclor 1260	ok							
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

PCB Calibration Summary - Page 3

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40500

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH01</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345205</u>	
Phase Weight:	<u>10.0</u>	Date Received:	<u>10/16/97</u>	
Injection Volume:	<u>1.0</u>	Date Extracted:	<u>12/17/97</u>	
Dilution Factor:	<u>2.0</u>	Date Analyzed:	<u>01/31/98</u>	
% Solids:	<u>200 <i>pk</i> 10/10/98</u>	Sulfur Clean-up:	<u>Y</u>	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	<i>pk</i> <i>5</i>
11104-28-2	Aroclor-1221	100	<i>pk</i> <i>5</i>
11141-16-5	Aroclor-1232	100	<i>pk</i> <i>5</i>
53469-21-9	Aroclor-1242	100	<i>pk</i> <i>5</i>
12672-29-6	Aroclor-1248	330	<i>pk</i> <i>5</i>
11097-69-1	Aroclor-1254	450	<i>pk</i> <i>5</i>
11096-82-5	Aroclor-1260	94	<i>pk</i> <i>5</i>

REVIEW
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40502

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH01</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345207</u>	
Phase Weight:	<u>10.0</u>	(g)	Date Received:	<u>10/16/97</u>
Injection Volume:	<u>1.0</u>	(uL)	Date Extracted:	<u>12/17/97</u>
Dilution Factor:	<u>1.0</u>		Date Analyzed:	<u>01/31/98</u>
% Solids:	<u>100</u>		Sulfur Clean-up:	<u>Y</u> (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 58
11104-28-2	Aroclor-1221	50	✓ 58
11141-16-5	Aroclor-1232	50	✓ 58
53469-21-9	Aroclor-1242	50	✓ 58
12672-29-6	Aroclor-1248	290	
11097-69-1	Aroclor-1254	330	✓ 58
11096-82-5	Aroclor-1260	59	✓ 58

REVISE
APR 06 1998

By KKE

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40503C

Lab Name:	ITS Environmental	Lab Code:	INCHVT	
Contract:	91082	Case:	PCB	SDG: FISH01
Phase Type:	BIOTA	Lab Sample ID:	345208	
Phase Weight:	10.0 (g)	Date Received:	10/16/97	
Injection Volume:	1.0 (uL)	Date Extracted:	12/17/97	
Dilution Factor:	2.0	Date Analyzed:	01/31/98	
% Solids:	300 <i>μg/g</i>	Sulfur Clean-up:	Y	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	✓ 5
11104-28-2	Aroclor-1221	100	✓ 5
11141-16-5	Aroclor-1232	100	✓ 5
53469-21-9	Aroclor-1242	100	✓ 5
12672-29-6	Aroclor-1248	100	✓ 5
11097-69-1	Aroclor-1254	1000	✓ 5
11096-82-5	Aroclor-1260	97	J

REVISE
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40506

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345209

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 10.0

Date Analyzed: 01/31/98

% Solids: 100% *100% 100%*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	✓ <i>13</i>
11104-28-2	Aroclor-1221	500	✓ <i>13</i>
11141-16-5	Aroclor-1232	500	✓ <i>13</i>
53469-21-9	Aroclor-1242	500	✓ <i>13</i>
12672-29-6	Aroclor-1248	500	✓ <i>13</i>
11097-69-1	Aroclor-1254	3200	✓ <i>13</i>
11096-82-5	Aroclor-1260	290	✓ <i>13</i>

REVIS
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40507

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345210

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 01/31/98

% Solids: ~~100~~ 100

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	45
11104-28-2	Aroclor-1221	100	45
11141-16-5	Aroclor-1232	100	45
53469-21-9	Aroclor-1242	100	45
12672-29-6	Aroclor-1248	470	45
11097-69-1	Aroclor-1254	630	45
11096-82-5	Aroclor-1260	180	45

REVISED
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40508

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345211

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 10.0

Date Analyzed: 01/31/98

% Solids: 100% ~~100%~~

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	✓
11104-28-2	Aroclor-1221	500	✓
11141-16-5	Aroclor-1232	500	✓
53469-21-9	Aroclor-1242	500	✓
12672-29-6	Aroclor-1248	500	✓
11097-69-1	Aroclor-1254	4900	
11096-82-5	Aroclor-1260	1000	

REVISE
APR 06 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40509

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345212

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 20.0

Date Analyzed: 01/31/98

% Solids: 200 ~~100~~ ~~100~~

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	1000	# B
11104-28-2	Aroclor-1221	1000	# B
11141-16-5	Aroclor-1232	1000	# B
53469-21-9	Aroclor-1242	3000	# B
12672-29-6	Aroclor-1248	1000	# B
11097-69-1	Aroclor-1254	13000	# B
11096-82-5	Aroclor-1260	1300	# B

REVISE
APR 06 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40511

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345214

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 01/31/98

% Solids: 200/100/100

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	B
11104-28-2	Aroclor-1221	250	B
11141-16-5	Aroclor-1232	250	B
53469-21-9	Aroclor-1242	250	B
12672-29-6	Aroclor-1248	1100	
11097-69-1	Aroclor-1254	1500	
11096-82-5	Aroclor-1260	340	

REVIEW
APR 06 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40512

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345215

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 10.0

Date Analyzed: 01/31/98

% Solids: 100 *100*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	4 5
11104-28-2	Aroclor-1221	500	4 5
11141-16-5	Aroclor-1232	500	4 5
53469-21-9	Aroclor-1242	500	4 5
12672-29-6	Aroclor-1248	500	4 5
11097-69-1	Aroclor-1254	5200	4 5
11096-82-5	Aroclor-1260	810	4 5

REVISE
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40513

Lab Name: ITS Environmental Lab Code: INCHVT
Contract: 91082 Case: PCB SDG: FISH01
Phase Type: BIOTA Lab Sample ID: 345216
Phase Weight: 10.0 (g) Date Received: 10/16/97
Injection Volume: 1.0 (uL) Date Extracted: 12/17/97
Dilution Factor: 1.0 Date Analyzed: 01/31/98
% Solids: 100 *100* Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓
11104-28-2	Aroclor-1221	50	✓
11141-16-5	Aroclor-1232	50	✓
53469-21-9	Aroclor-1242	50	✓
12672-29-6	Aroclor-1248	330	
11097-69-1	Aroclor-1254	310	
11096-82-5	Aroclor-1260	80	

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40514

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345217

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 01/31/98

% Solids: 100% 10/16/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 12/17/97
11104-28-2	Aroclor-1221	50	✓ 12/17/97
11141-16-5	Aroclor-1232	50	✓ 12/17/97
53469-21-9	Aroclor-1242	50	✓ 12/17/97
12672-29-6	Aroclor-1248	530	✓ 12/17/97
11097-69-1	Aroclor-1254	370	✓ 12/17/97
11096-82-5	Aroclor-1260	71	✓ 12/17/97

REVISI
APR 06 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40515

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH01</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345218</u>	
Phase Weight:	<u>10.0</u>	(g)	Date Received:	<u>10/16/97</u>
Injection Volume:	<u>1.0</u>	(uL)	Date Extracted:	<u>12/17/97</u>
Dilution Factor:	<u>10.0</u>		Date Analyzed:	<u>01/31/98</u>
% Solids:	<u>100% <i>KAC</i></u>		Sulfur Clean-up:	<u>Y</u> (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	<i>F</i> <i>15</i>
11104-28-2	Aroclor-1221	500	<i>F</i> <i>15</i>
11141-16-5	Aroclor-1232	500	<i>F</i> <i>15</i>
53469-21-9	Aroclor-1242	500	<i>F</i> <i>15</i>
12672-29-6	Aroclor-1248	1500	
11097-69-1	Aroclor-1254	2100	<i>15</i>
11096-82-5	Aroclor-1260	560	<i>15</i>

REVISE
APR 06 1998

By *KAC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40516

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345219

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 01/31/98

% Solids: 100% *all 198*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	# 5
11104-28-2	Aroclor-1221	250	# 5
11141-16-5	Aroclor-1232	250	# 5
53469-21-9	Aroclor-1242	250	# 5
12672-29-6	Aroclor-1248	250	# 5
11097-69-1	Aroclor-1254	2000	# 4
11096-82-5	Aroclor-1260	350	# 4

REVISE
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40504-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345420

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 01/31/98

% Solids: 100% ~~100~~ 11/19/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	✓
11104-28-2	Aroclor-1221	150	✓
11141-16-5	Aroclor-1232	150	✓
53469-21-9	Aroclor-1242	150	✓
12672-29-6	Aroclor-1248	590	
11097-69-1	Aroclor-1254	700	
11096-82-5	Aroclor-1260	150	

REVISE
APR 06 1998

FORM 1
 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40517-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345421

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/05/98

% Solids: 100 *100*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	<i>4</i>
11104-28-2	Aroclor-1221	50	<i>4</i>
11141-16-5	Aroclor-1232	50	<i>4</i>
53469-21-9	Aroclor-1242	50	<i>4</i>
12672-29-6	Aroclor-1248	50	<i>4</i>
11097-69-1	Aroclor-1254	200	<i>4</i>
11096-82-5	Aroclor-1260	39	<i>4</i>

REVISED
 APR 06 1998

By *KPC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40518-C

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH01</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345422</u>	
Phase Weight:	<u>10.0</u>	Date Received:	<u>10/18/97</u>	
Injection Volume:	<u>1.0</u>	Date Extracted:	<u>12/17/97</u>	
Dilution Factor:	<u>1.0</u>	Date Analyzed:	<u>02/05/98</u>	
% Solids:	<u>100% <i>all K18</i></u>	Sulfur Clean-up:	<u>Y</u>	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	<i>Y</i>
11104-28-2	Aroclor-1221	50	<i>Y</i>
11141-16-5	Aroclor-1232	50	<i>Y</i>
53469-21-9	Aroclor-1242	50	<i>Y</i>
12672-29-6	Aroclor-1248	50	<i>Y</i>
11097-69-1	Aroclor-1254	310	<i>Y</i>
11096-82-5	Aroclor-1260	58	<i>Y</i>

REVIS.
APR 06 1998

By *KPC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40519-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345423

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/05/98

% Solids: 200 ug
11/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	5
11104-28-2	Aroclor-1221	50	5
11141-16-5	Aroclor-1232	50	5
53469-21-9	Aroclor-1242	50	5
12672-29-6	Aroclor-1248	50	5
11097-69-1	Aroclor-1254	230	4
11096-82-5	Aroclor-1260	43	5

REVISED
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40520-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345424

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/05/98

% Solids: 100% *10/1/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 55
11104-28-2	Aroclor-1221	50	✓ 55
11141-16-5	Aroclor-1232	50	✓ 55
53469-21-9	Aroclor-1242	50	✓ 55
12672-29-6	Aroclor-1248	50	✓ 55
11097-69-1	Aroclor-1254	210	✓ 45
11096-82-5	Aroclor-1260	36	J

REVIS
APR 06 1998

PERCENT LIPID ANALYSES

Percent Lipids Results

[illegible]

CHAIN OF CUSTODY

CHAIN OF CUSTODY RECORD

000004

PROJ. NO.		PROJECT NAME		NO OF CONTAINERS		<div style="display: flex; justify-content: space-around;"> <div>Whole Fish</div> <div>PCBs (Aroclor)</div> <div>9 Lipids</div> </div>						REMARKS		
SAMPLERS: (Signature)														
STA. NO.	DATE	TIME	LAB	GRAB	STATION LOCATION									
K 40500	10/14/97	1712		X	New Richmond - ABSA #11	1	X	X						
K 40501				X										
K 40502				X										
K 40503			X											
K 40504			X											
K 40512				X										
K 40513														
K 40514														
K 40515														
K 40516														
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
K 40517			10/15/97 17:50											
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time			Remarks			
					Sharon Mena			10/14/97 0830						

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

COPY ORIGINAL ON FILE

SDG # 515101

FTR # 101952

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO OF CONTAINERS		<div>Whole Fish</div> <div>PCBs (Aroclor)</div> <div>2 Lipids</div>						REMARKS
SAMPLERS: (Signature)												
STA. NO.	DATE	TIME	CONT	GRAB	STATION LOCATION							
K 40500	10/15/97	1310		X	New Richmond - ABSA #11	1	X	X				Fillet and analyze following analytical procedures discussed previously
K 40501				X		1	X	X				Analyze whole-body composite as directed above. Retain for combination w/ additional samples. Fillet and analyze following analytical procedures discussed previously.
K 40502				X								
K 40503			X									
K 40504			X									
K 40512				X								
K 40513												
K 40514												
K 40515												
K 40516												

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	10/15/97 17:50				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
			10/16/97 09:30		



BLASLAND & BOUCK
ENGINEERS, P.C.

00000

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO OF CON- TAINERS		<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Whole Fish</div> <div style="border: 1px solid black; padding: 5px;"> <div style="border-bottom: 1px solid black; padding-bottom: 2px;">P/L (Aerobic)</div> <div style="border-bottom: 1px solid black; padding-bottom: 2px;">or</div> <div style="border-bottom: 1px solid black; padding-bottom: 2px;">Liquids</div> </div> </div>						REMARKS	
SAMPLERS: (Signature)													
STA. NO.	DATE	TIME	CONT.	GRAB	STATION LOCATION								
K 40506	10/14/97	12:25		X	New Richmond AGSA #11	1	X	X					Fillet and analyze skin off fillets following analytical procedures discussed previously
K 40507													
K 40508													
K 40509													
K 40510													
K 40511													
Relinquished by: (Signature)			Date / Time		Received by: (Signature)		Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
Relinquished by: (Signature)			Date / Time		Received by: (Signature)		Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks				

6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

2000000

PROJ. NO.		PROJECT NAME					Whole Fish										REMARKS
64524711		Kalamazoo River Resident Fish					Number of Containers										
SAMPLERS: (Signature)							PLA (Analog)										
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION												
40504-C2	10/11/97	14:00	X		New Richmond ABSA #11 Juvenile SM Bass		1	X	X							Combine K40504-C2 with K40504-C1 (provided earlier)	
40530-C																Process all Juvenile bass composite samples as whole-body composites and analyze following analytical procedures discussed previously.	
40531-C																	
40532-C																	
40533-C	10/11/97	10:00	X		Lake Allegan ABSA #9 Juvenile SM Bass												
40534-C1	"	"	"		"											* Return C-1 to combine with 40534 C-2 which will follow at later date	
40535	10/17/97	10:00		X	Lake Allegan ABSA #9 Adult Carp		1	X	X							Filet carp (skin-off filets) and bass (skin-on, scales-on filets) and analyze filets following analytical procedures discussed previously.	
K40536																	
K40537																	
K40538																	
K40539																	
K40540					Lake Allegan ABSA #9 Adult Bass												
K40541																	
K40542																	

Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)	
K40542		10/17/97	16:30								
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)	
Relinquished by: (Signature)		DATE	TIME	Received for Laboratory by: (Signature)		DATE	TIME	Remarks:			
				Mason Nier		10/18/97	11:45				



MASLAND & SOUCK
ENGINEERS, P.C.

800000

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO OF CONTAINERS		Whole Fish PCBs (Aroclors) % Lipids						REMARKS	
SAMPLERS: (Signature)													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
K10517-C	10/15		X		Jellyville Sm Bass MORROW POND - ABSA # 2	1	X	X				Analyze whole body comp. to samples fillet and analyze following analytical procedures discussed previously.	
K10518-C	10/15		X										
K10519-C	10/15		X										
K10520-C	10/15		X										
K10521				X	Morrow Pond Adult Carp ABSA #2							Fillet and analyze following analytical procedures discussed previously.	
K10522												carp (skin-off fillets) Sm Bass (skin-on, series-on fillets).	
K10523													
K10524													
K10525													
K10526													
K10527					Morrow Pond Adult ABSA #2 Sm Bass								
K10528													
K10529													
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Date / Time			Received by: (Signature)		
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Date / Time			Received by: (Signature)		
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time			Remarks		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH02

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH02 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40521	345425	tissue	10/15/97			x		x
K40522	345426	tissue	10/15/97			x		x
K40523*	345427	tissue	10/15/97			x		x
K40525	345429	tissue	10/15/97			x		x
K40526	345430	tissue	10/15/97			x		x
K40527	345431	tissue	10/15/97			x		x
K40528	345432	tissue	10/15/97			x		x
K40529	345433	tissue	10/15/97			x		x
K40530-C	345434	tissue	10/15/97			x		x
K40531-C	345435	tissue	10/16/97			x		x
K40532-C	345436	tissue	10/16/97			x		x
K40533-C	345437	tissue	10/16/97			x		x
K40535	345438	tissue	10/17/97			x		x
K40536	345439	tissue	10/17/97			x		x
K40537	345440	tissue	10/17/97			x		x
K40538	345441	tissue	10/17/97			x		x
K40539	345442	tissue	10/17/97			x		x
K40540	345443	tissue	10/17/97			x		x

* MS/MSD performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples except K40523, K40523MS and K40523MSD were analyzed beyond the specified holding time. Based on the deviation, data for all samples except K40523, K40523MS and K40523MSD have been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for both surrogates were above control limits in the extraction blank. Since recoveries for all samples associated with the blank were acceptable, no action has been taken based on the deviation.

All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	_____	_____	<u>X</u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u>X</u>	_____	_____
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u>X</u>	_____	_____
Were any electronegative displacement (negative peaks) or unusual peaks detected?	_____	<u>X</u>	_____
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	_____	_____	<u>X</u>

**PCB Holding Time and Surrogate
Recovery Summary**

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40521	+28		
K40522	+28		
K40523			
K40523MS			
K40523MSD			
K40525	+28		
K40526	+28		
K40527	+28		
K40528	+28		
K40529	+28		
K40530-C	+28		
K40531-C	+28		
K40532-C	+28		
K40533-C	+28		
K40535	+25		
K40536	+25		
K40537	+25		
K40538	+25		
K40539	+25		
K40540	+25		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 † Recovery high
 ‡ Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date	2/04/98- 2/05/98	2/05/98	2/05/98					
Time		1308	1335					
	Initial Cal.	Cont. Cal.	Cont. Cal.					
	%RSD	%D	%D					
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok						
Aroclor 1254	ok							
Aroclor 1260	ok							
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

PCB Calibration Summary - Page 2

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

PCB Calibration Summary - Page 3

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40521

Lab Name: ITS Environmental

Lab Code: WCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345425

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 20% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	B 5
11104-28-2	Aroclor-1221	50	B 5
11141-16-5	Aroclor-1232	50	B 5
53469-21-9	Aroclor-1242	50	B 5
12672-29-6	Aroclor-1248	50	B 5
11097-69-1	Aroclor-1254	28	J
11096-82-5	Aroclor-1260	33	J

REVISE
APR 07 1998

By Kle

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40522

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345426

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100 / 114%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	H 55
11104-28-2	Aroclor-1221	50	H 55
11141-16-5	Aroclor-1232	50	H 55
53469-21-9	Aroclor-1242	50	H 55
12672-29-6	Aroclor-1248	50	H
11097-69-1	Aroclor-1254	130	
11096-82-5	Aroclor-1260	26	J

REVISE
APR 07 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40523

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345427

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 01/16/98

Dilution Factor: 3.0

Date Analyzed: 02/19/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	150	U
11096-82-5	Aroclor-1260	150	U

REVISE
APR 07 1998

By Kfe

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40525

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345429

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100% ~~LA~~ 41198

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R 13
11104-28-2	Aroclor-1221	50	R 13
11141-16-5	Aroclor-1232	50	R 13
53469-21-9	Aroclor-1242	50	R 13
12672-29-6	Aroclor-1248	50	R 13
11097-69-1	Aroclor-1254	73	R 13
11096-82-5	Aroclor-1260	30	J

REVIS-
APR 07 1998

By KE

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40526

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345430

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 200 ~~411~~ 41198

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R B
11104-28-2	Aroclor-1221	50	R B
11141-16-5	Aroclor-1232	50	R B
53469-21-9	Aroclor-1242	50	R B
12672-29-6	Aroclor-1248	50	R B
11097-69-1	Aroclor-1254	150	H
11096-82-5	Aroclor-1260	38	J

REVISE
APR 07 1998

By KAC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40527

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345431

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100% 47146

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R 15
11104-28-2	Aroclor-1221	50	R 15
11141-16-5	Aroclor-1232	50	R 15
53469-21-9	Aroclor-1242	50	R 15
12672-29-6	Aroclor-1248	50	R 15
11097-69-1	Aroclor-1254	280	R 15
11096-82-5	Aroclor-1260	63	R 15

REVISL
APR 07 1998

By KAC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40528

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH02</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345432</u>	
Phase Weight:	<u>10.0</u> (g)	Date Received:	<u>10/18/97</u>	
Injection Volume:	<u>1.0</u> (uL)	Date Extracted:	<u>12/17/97</u>	
Dilution Factor:	<u>1.0</u>	Date Analyzed:	<u>02/23/98</u>	
% Solids:	<u>100% 41%</u>	Sulfur Clean-up:	<u>Y</u> (Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	R
53469-21-9	Aroclor-1242	50	R
12672-29-6	Aroclor-1248	50	R
11097-69-1	Aroclor-1254	120	
11096-82-5	Aroclor-1260	35	J

REVISE
APR 07 1998
By Kec

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40529

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345433

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100 ^{pk} 4/7/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	g
11104-28-2	Aroclor-1221	50	g
11141-16-5	Aroclor-1232	50	g
53469-21-9	Aroclor-1242	50	g
12672-29-6	Aroclor-1248	50	g
11097-69-1	Aroclor-1254	110	g
11096-82-5	Aroclor-1260	50	g

REVIS
APR 07 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40530-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345434

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/23/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	# 12
11104-28-2	Aroclor-1221	150	# 13
11141-16-5	Aroclor-1232	150	# 14
53469-21-9	Aroclor-1242	150	# 15
12672-29-6	Aroclor-1248	480	# 16
11097-69-1	Aroclor-1254	640	# 17
11096-82-5	Aroclor-1260	150	# 18

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40531-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345435

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/23/98

% Solids: 100% 41742

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	560	
11097-69-1	Aroclor-1254	600	
11096-82-5	Aroclor-1260	140	J

REVISED
APR 07 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40532-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345436

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/23/98

% Solids: 100% 417K

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	P
11104-28-2	Aroclor-1221	150	P
11141-16-5	Aroclor-1232	150	P
53469-21-9	Aroclor-1242	150	P
12672-29-6	Aroclor-1248	560	
11097-69-1	Aroclor-1254	780	
11096-82-5	Aroclor-1260	150	P

REVISE
APR 07 1998

By KK

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40533-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345437

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 02/23/98

% Solids: 100% 4/11/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	# 15
11104-28-2	Aroclor-1221	250	# 15
11141-16-5	Aroclor-1232	250	# 15
53469-21-9	Aroclor-1242	250	# 15
12672-29-6	Aroclor-1248	1500	
11097-69-1	Aroclor-1254	900	15
11096-82-5	Aroclor-1260	260	15

REVISE
APR 07 1998

By KLC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40535

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345438

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 02/20/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	# 13
11104-28-2	Aroclor-1221	250	# 13
11141-16-5	Aroclor-1232	250	# 13
53469-21-9	Aroclor-1242	250	# 13
12672-29-6	Aroclor-1248	600	# 13
11097-69-1	Aroclor-1254	700	# 13
11096-82-5	Aroclor-1260	190	J

REVISE
APR 07 1998

By Kle

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40536

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH02</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345439</u>	
Phase Weight:	<u>10.0</u> (g)	Date Received:	<u>10/18/97</u>	
Injection Volume:	<u>1.0</u> (uL)	Date Extracted:	<u>12/17/97</u>	
Dilution Factor:	<u>1.0</u>	Date Analyzed:	<u>02/20/98</u>	
% Solids:	<u>100% 41%</u>	Sulfur Clean-up:	<u>Y</u> (Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	F (B)
11104-28-2	Aroclor-1221	50	F (B)
11141-16-5	Aroclor-1232	50	F (B)
53469-21-9	Aroclor-1242	50	F (B)
12672-29-6	Aroclor-1248	120	(B)
11097-69-1	Aroclor-1254	160	(B)
11096-82-5	Aroclor-1260	76	(B)

REVISED
APR 07 1998

By kle

000179

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40537

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345440

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 02/20/98

% Solids: 200 *pk* 41748

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	<i>pk</i>
11104-28-2	Aroclor-1221	100	<i>pk</i>
11141-16-5	Aroclor-1232	100	<i>pk</i>
53469-21-9	Aroclor-1242	100	<i>pk</i>
12672-29-6	Aroclor-1248	100	<i>pk</i>
11097-69-1	Aroclor-1254	350	<i>pk</i>
11096-82-5	Aroclor-1260	95	<i>pk</i>

REVISE
APR 07 1998

By *pk*

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40538

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345441

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/20/98

% Solids: 100% AHHK

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R
11104-28-2	Aroclor-1221	50	R
11141-16-5	Aroclor-1232	50	R
53469-21-9	Aroclor-1242	50	R
12672-29-6	Aroclor-1248	130	
11097-69-1	Aroclor-1254	50	R
11096-82-5	Aroclor-1260	130	

REVIS
APR 07 1998

By Kee

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40539

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345442

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 02/20/98

% Solids: 100% 4/19/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	✓ B
11104-28-2	Aroclor-1221	100	✓ B
11141-16-5	Aroclor-1232	100	✓ B
53469-21-9	Aroclor-1242	100	✓ B
12672-29-6	Aroclor-1248	320	✓ B
11097-69-1	Aroclor-1254	650	✓ B
11096-82-5	Aroclor-1260	100	✓ B

REVISE
APR 07 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40540

Lab Name: ITS Environmental

Lab Code: WCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345443

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/20/98

% Solids: 100% 217M8

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	13
11104-28-2	Aroclor-1221	150	13
11141-16-5	Aroclor-1232	150	13
53469-21-9	Aroclor-1242	150	13
12672-29-6	Aroclor-1248	680	
11097-69-1	Aroclor-1254	900	
11096-82-5	Aroclor-1260	150	13

REVIEW
APR 07 1998

By WKE

000165

PERCENT LIPID ANALYSES

Percent Lipids Results

[illegible]

CHAIN OF CUSTODY



MASLAND & BOUCH
ENGINEERS, P.C.

000003

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO. OF CONTAINERS		Whole Fish	PCAs (Arclars)	% Lipids								REMARKS
SAMPLERS: (Signature)																
STA. NO.	DATE	TIME	GRAB	STATION LOCATION												
K10517-C	10/15		X	5m fish Morro POND - ABSA # 2	1	X	X									Analyze whole body composite samples fillet and analyze following analytical procedures discussed previously.
K10518-C	10/15		X													
K10519-C	10/15		X													
K10520-C	10/15		X													
K10521			X	Morro POND Adult Cuck ABN#2												Fillet and analyze following analytical procedures discussed previously
K10522																
K10523																carp (skin-off fillets) SM Asses (skin-on, scales-on fillets).
K10524																
K10525																
K10526																
K10527				Morro POND Adult SM Asses ABN#2												
K10528																
K10529																

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	10/17/97 16:50				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
			10/18/97 1445	COPY - ORIGINAL ON FILE SDG # 815101 ETR # 1905	

CHAIN OF CUSTODY RECORD

000004

PROJ. NO.		PROJECT NAME					Whole Fish	Number of Containers	PLAC (Anchor)	g Lipid						REMARKS
6524711		Kalamazoo River Resident Fish														
SAMPLERS: (Signature)																
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION											
K 40504-C2	10/11/97	14:00	X		New Richmond ABSA #11 Juvenile Sm Bass		1	X	X							Combine K40504-C2 with K40504-C1 (provided earlier)
K 40530-C																Process all Juvenile bass composite samples as
K 40531-C																whole-body composites and analyze following analytical
K 40532-C																procedures discussed previously.
K 40533-C	10/11/97	10:00	X		Lake Michigan ABSA #9 Juvenile Sm Bass											
K 40534-C1	"	"	"													* K40534 C-1 to combine with 40534 C-2 which will follow at a later date
K 40535	10/17/97	10:00		X	Lake Allegan ABSA #9 Adult Carp		1	X	X							Fillet carp (skin-off fillets) and bass (skin-on, scales-on fillets) and analyze fillets following analytical procedures discussed previously
K 40536																
K 40537																
K 40538																
K 40539																
K 40540					Lake Allegan ABSA #9 Adult Bass											
K 40541																
K 40542																

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
Kal D. Stetson	10/17/97	16:30					
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	Relinquished by: (Signature)	DATE	TIME	Relinquished by: (Signature)
Relinquished by: (Signature)	DATE	TIME	Received for Laboratory by: (Signature)	DATE	TIME	Remarks:	
			Sharon Miller	10/17/97	16:45	COPY - ORIGINAL ON FILE SDG & FST 11/1/97 ETR 11/1/97	

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH03

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH03 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40542	345446	tissue	10/17/97			x		x
K40543	345447	tissue	10/16/97			x		x
K40544	345448	tissue	10/16/97			x		x
K40545	345449	tissue	10/16/97			x		x
K40546	345450	tissue	10/16/97			x		x
K40547	345451	tissue	10/16/97			x		x
K40548	345452	tissue	10/16/97			x		x
K40549	345453	tissue	10/16/97			x		x
K40550	345454	tissue	10/16/97			x		x
K40552	345510	tissue	10/20/97			x		x
K40553	345511	tissue	10/20/97			x		x
K40554	345512	tissue	10/20/97			x		x
K40555	345513	tissue	10/20/97			x		x
K40556	345514	tissue	10/20/97			x		x
K40557	345515	tissue	10/20/97			x		x
K40568	345516	tissue	10/21/97			x		x
K40569	345517	tissue	10/21/97			x		x
K40570	345518	tissue	10/21/97			x		x
K40571	345519	tissue	10/21/97			x		x
K40572	345520	tissue	10/21/97			x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed beyond the specified holding time. Based on the deviation, all data has been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries for both surrogates were above control limits in samples K40544 and K40547. All positive data for these samples have been qualified as estimated based on the recoveries. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

Due to a poor chromatographic pattern match, data for Aroclor 1254 in sample K40549, data for Aroclor 1260 in sample K40552 and data for Aroclor 1242 and 1260 in sample K40548 have been qualified as estimated with presumptive evidence of identification.

The Aroclors present in sample K40550 have been misidentified. The correct identifications should be Aroclors 1248, 1254 and 1260. The data have been corrected to reflect the change.

All other Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u> </u>	<u>X</u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u> </u>	<u>X</u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	_____	_____	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	_____	_____
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	_____	_____
Were any electronegative displacement (negative peaks) or unusual peaks detected?	_____	<u> X </u>	_____
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	_____	_____	<u> X </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40542	+26		
K40543	+26		
K40544	+29		
K40545	+26		
K40546	+26		
K40547	+29		
K40548	+26		
K40549	+26		
K40550	+26		
K40552	+26		
K40553	+26		
K40554	+26		
K40555	+26		
K40556	+25		
K40557	+26		
K40568	+26		
K40569	+26		
K40570	+26		
K40571	+26		
K40572	+26		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 ! Recovery high
 : Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

PCB Calibration Summary - Page 2

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date:	2/18/98- 2/19/98	2/21/98	2/23/98	2/23	2/24	2/24		
Time:		1815	2329	2355	0141	0207		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.		
	%RSD	%D	%D	%D	%D	%D		
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok	ok		ok				
Aroclor 1248	ok		ok		ok			
Aroclor 1254	ok					ok		
Aroclor 1260	ok							
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40542

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345446

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100 *100*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	<i>R</i>
11104-28-2	Aroclor-1221	50	<i>R</i>
11141-16-5	Aroclor-1232	50	<i>R</i>
53469-21-9	Aroclor-1242	50	<i>R</i>
12672-29-6	Aroclor-1248	250	
11097-69-1	Aroclor-1254	170	
11096-82-5	Aroclor-1260	92	

REVISED
APR 07 1998

By *KPC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40543

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345447

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/17/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R 13
11104-28-2	Aroclor-1221	50	R 13
11141-16-5	Aroclor-1232	50	R 13
53469-21-9	Aroclor-1242	50	R 13
12672-29-6	Aroclor-1248	170	
11097-69-1	Aroclor-1254	150	H
11096-82-5	Aroclor-1260	43	J

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40544

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345448

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 4.0

Date Analyzed: 02/24/98

% Solids: 100% ~~YR~~ 4/11/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	200	✓ 5
11104-28-2	Aroclor-1221	200	✓ 5
11141-16-5	Aroclor-1232	200	✓ 5
53469-21-9	Aroclor-1242	200	✓ 5
12672-29-6	Aroclor-1248	930	✓ 5
11097-69-1	Aroclor-1254	1400	✓ 5
11096-82-5	Aroclor-1260	290	✓ 5

REVISE
APR 07 1998

By KRC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40545

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345449

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 47.1%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	4
11104-28-2	Aroclor-1221	50	4
11141-16-5	Aroclor-1232	50	4
53469-21-9	Aroclor-1242	60	4
12672-29-6	Aroclor-1248	50	4
11097-69-1	Aroclor-1254	280	4
11096-82-5	Aroclor-1260	44	J

REVIS
APR 07 1998
By KR

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40546

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345450

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/11/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# 6/13/97
11104-28-2	Aroclor-1221	50	# 6/13/97
11141-16-5	Aroclor-1232	50	# 6/13/97
53469-21-9	Aroclor-1242	50	# 6/13/97
12672-29-6	Aroclor-1248	430	# 6/13/97
11097-69-1	Aroclor-1254	50	# 6/13/97
11096-82-5	Aroclor-1260	110	# 6/13/97

REVISE
APR 07 1998

By KAC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40547

Lab Name: ITS Environmental

Lab Code: INCH/T

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345451

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 4.0

Date Analyzed: 02/24/98

% Solids: 100% *ALL ANALY*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	200	# 1/5
11104-28-2	Aroclor-1221	200	# 1/5
11141-16-5	Aroclor-1232	200	# 1/5
53469-21-9	Aroclor-1242	200	# 1/5
12672-29-6	Aroclor-1248	1300	
11097-69-1	Aroclor-1254	3000	
11096-82-5	Aroclor-1260	200	# 1/5

REVIS
APR 07 1998

By *KFC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40548

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345452

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% A/TAG

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 13
11104-28-2	Aroclor-1221	50	✓ 13
11141-16-5	Aroclor-1232	50	✓ 13
53469-21-9	Aroclor-1242	240	✓ 13
12672-29-6	Aroclor-1248	50	✓ 13
11097-69-1	Aroclor-1254	50	✓ 13
11096-82-5	Aroclor-1260	110	✓ 13

REVIS
APR 07 '98

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40549

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345453

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/21/98

% Solids: 100% *KL* *ATMS*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	<i>R</i> <i>B</i>
11104-28-2	Aroclor-1221	150	<i>R</i> <i>B</i>
11141-16-5	Aroclor-1232	150	<i>R</i> <i>B</i>
53469-21-9	Aroclor-1242	150	<i>R</i> <i>B</i>
12672-29-6	Aroclor-1248	150	<i>R</i> <i>B</i>
11097-69-1	Aroclor-1254	1000	<i>R</i> <i>B</i>
11096-82-5	Aroclor-1260	150	<i>R</i> <i>B</i>

REVIS
APR 07 1998

By *KL*

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40550

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345454

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/17/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 13
11104-28-2	Aroclor-1221	50	✓ 13
11141-16-5	Aroclor-1232	50	✓ 13
53469-21-9	Aroclor-1242	50	✓ 13
12672-29-6	Aroclor-1248	270 580	✓ 13
11097-69-1	Aroclor-1254	230 50	✓ 13
11096-82-5	Aroclor-1260	60 120	✓ 13

REVISE
APR 07 1998

By Kll

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40552

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345510

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/21/98

% Solids: 100% 4/17/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	# 15
11104-28-2	Aroclor-1221	150	# 15
11141-16-5	Aroclor-1232	150	# 15
53469-21-9	Aroclor-1242	150	# 15
12672-29-6	Aroclor-1248	150	# 15
11097-69-1	Aroclor-1254	150	# 15
11096-82-5	Aroclor-1260	270	# 15

REVISE
APR 07 1998

By KPC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40553

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH03</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345511</u>	
Phase Weight:	<u>10.0</u>	(g)	Date Received:	<u>10/23/97</u>
Injection Volume:	<u>1.0</u>	(uL)	Date Extracted:	<u>12/17/97</u>
Dilution Factor:	<u>1.0</u>		Date Analyzed:	<u>02/21/98</u>
% Solids:	<u>100% 4/7/98</u>		Sulfur Clean-up:	<u>Y</u> (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 5
11104-28-2	Aroclor-1221	50	✓ 5
11141-16-5	Aroclor-1232	50	✓ 5
53469-21-9	Aroclor-1242	50	✓ 5
12672-29-6	Aroclor-1248	50	✓ 5
11097-69-1	Aroclor-1254	87	✓ 5
11096-82-5	Aroclor-1260	34	✓

REVISE
APR 07 1998

By KLC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40554

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345512

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/21/98

% Solids: 100% 47198

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	4
11104-28-2	Aroclor-1221	150	4
11141-16-5	Aroclor-1232	150	4
53469-21-9	Aroclor-1242	150	4
12672-29-6	Aroclor-1248	150	4
11097-69-1	Aroclor-1254	190	4
11096-82-5	Aroclor-1260	460	4

REVISE
APR 07 1998

By KK

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40555

Lab Name:	ITS Environmental	Lab Code:	INCHVT	SDG:	FISH03
Contract:	91082	Case:	PCB		
Phase Type:	BIOTA	Lab Sample ID:	345513		
Phase Weight:	10.0 (g)	Date Received:	10/23/97		
Injection Volume:	1.0 (uL)	Date Extracted:	12/17/97		
Dilution Factor:	2.0	Date Analyzed:	02/21/98		
% Solids:	100% <i>pk</i> 4/1/98	Sulfur Clean-up:	Y (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	<i>pk</i>
11104-28-2	Aroclor-1221	100	<i>pk</i>
11141-16-5	Aroclor-1232	100	<i>pk</i>
53469-21-9	Aroclor-1242	100	<i>pk</i>
12672-29-6	Aroclor-1248	100	<i>pk</i>
11097-69-1	Aroclor-1254	310	<i>pk</i>
11096-82-5	Aroclor-1260	80	J

REVISE
APR 07 1998
By *pk*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40556

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345514

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100 KR 4/7/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 5/5
11104-28-2	Aroclor-1221	50	✓ 5/5
11141-16-5	Aroclor-1232	50	✓ 5/5
53469-21-9	Aroclor-1242	50	✓
12672-29-6	Aroclor-1248	50	✓
11097-69-1	Aroclor-1254	520	✓ 4/4
11096-82-5	Aroclor-1260	100	✓ 4/4

REVIS_E
APR 07 1998
By VK

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40557

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345515

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/17/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	5
11104-28-2	Aroclor-1221	50	5
11141-16-5	Aroclor-1232	50	5
53469-21-9	Aroclor-1242	50	5
12672-29-6	Aroclor-1248	50	5
11097-69-1	Aroclor-1254	140	4
11096-82-5	Aroclor-1260	32	4

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40568

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345516

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% *AK AMAS*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R <i>5</i>
11104-28-2	Aroclor-1221	50	R <i>5</i>
11141-16-5	Aroclor-1232	50	R <i>5</i>
53469-21-9	Aroclor-1242	50	R <i>5</i>
12672-29-6	Aroclor-1248	110	
11097-69-1	Aroclor-1254	140	
11096-82-5	Aroclor-1260	58	

REVISE
APR 07 1998

By *AK*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40569

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345517

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 02/21/98

% Solids: 100 YK 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	FF
11104-28-2	Aroclor-1221	250	R
11141-16-5	Aroclor-1232	250	R
53469-21-9	Aroclor-1242	250	R
12672-29-6	Aroclor-1248	250	R
11097-69-1	Aroclor-1254	1400	
11096-82-5	Aroclor-1260	250	J

REVISED
APR 07 1998

By VKC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40570

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345518

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97


Dilution Factor: 3.0

Date Analyzed: 02/21/98

% Solids: 100% 4/11/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	4 5
11104-28-2	Aroclor-1221	150	4 5
11141-16-5	Aroclor-1232	150	4 5
53469-21-9	Aroclor-1242	150	4 5
12672-29-6	Aroclor-1248	150	4 5
11097-69-1	Aroclor-1254	730	4 5
11096-82-5	Aroclor-1260	180	4 5

REVIS
APR 07 1998 
By KEC

00011.8

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40571

Lab Name: <u>ITS Environmental</u>	Lab Code: <u>INCHVT</u>	
Contract: <u>91082</u>	Case: <u>PCB</u>	SDG: <u>FISH03</u>
Phase Type: <u>BIOTA</u>	Lab Sample ID: <u>345519</u>	
Phase Weight: <u>10.0</u> (g)	Date Received: <u>10/23/97</u>	
Injection Volume: <u>1.0</u> (uL)	Date Extracted: <u>12/17/97</u>	
Dilution Factor: <u>1.0</u>	Date Analyzed: <u>02/21/98</u>	
% Solids: <u>100% AMPL</u>	Sulfur Clean-up: <u>Y</u> (Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R 5
11104-28-2	Aroclor-1221	50	R 5
11141-16-5	Aroclor-1232	50	R 5
53469-21-9	Aroclor-1242	50	R 5
12672-29-6	Aroclor-1248	150	R 5
11097-69-1	Aroclor-1254	370	R 5
11096-82-5	Aroclor-1260	47	J

REVISE
APR 07 1998

By KK

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40572

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345520

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 200 KPC 41798

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# 13/15
11104-28-2	Aroclor-1221	50	# 13/15
11141-16-5	Aroclor-1232	50	# 13/15
53469-21-9	Aroclor-1242	50	# 13/15
12672-29-6	Aroclor-1248	190	11/17/98
11097-69-1	Aroclor-1254	300	
11096-82-5	Aroclor-1260	88	

REVIS
APR 07 1998
By KPC

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result
K40542	345446	tissue	0.4%
K40543	345447	tissue	0.4%
K40544	345448	tissue	0.3%
K40545	345449	tissue	0.8%
K40546	345450	tissue	0.7%
K40547	345451	tissue	0.6%
K40548	345452	tissue	0.3%
K40549	345453	tissue	0.7%
K40550	345454	tissue	0.7%
K40552	345510	tissue	0.4%
K40553	345511	tissue	0.2%
K40554	345512	tissue	1.0%
K40555	345513	tissue	0.6%
K40556	345514	tissue	0.8%
K40557	345515	tissue	0.3%
K40568	345516	tissue	0.4%
K40569	345517	tissue	1.1%
K40570	345518	tissue	0.3%
K40571	345519	tissue	0.3%
K40572	345520	tissue	0.4%

CHAIN OF CUSTODY



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 448-9120

CHAIN OF CUSTODY RECORD

000004

PROJ. NO.		PROJECT NAME				Whole Fish		Number of Containers		P.B.C. (Anchors)		B. Lipids								REMARKS			
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION																		
K 40504-C2	10/14/97	14:00	X		New Richmond ABSA #11 Juvenile SM Bass	1	X	X												Combine K40504-C2 with K40504-C1 (provided earlier)			
K 40530-C																				Process all Juvenile bass composite samples as			
K 40531-C																				whole-body composites and analyze following analytical			
K 40532-C																				procedures discussed previously.			
K 40533-C	10/10/97	10:00	X		Lake Allegany ABSA #9 Juvenile SM Bass	1																	
K 40534-C1	"	"	"		"															* Retain C-1 to combine with 40534-C2 which will fillet			
K 40535	10/17/97	10:00		X	Lake Allegany ABSA #9 Adult Carp	1	X	X												Fillet carp (skin-off fillets) and bass (skin-on,			
K 40536																				scales-on fillets) and analyze fillets following			
K 40537																				analytical procedures discussed previously.			
K 40538																							
K 40539																							
K 40540					Lake Allegany ABSA #9 Adult Bass																		
K 40541																							
K 40542																							
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)					DATE	TIME	Relinquished by: (Signature)				
K 40542					10/17/97	16:30																	
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)					DATE	TIME	Relinquished by: (Signature)				
Relinquished by: (Signature)					DATE	TIME	Received for Laboratory by: (Signature)					DATE		TIME		Remarks							
							Mickie Miller					10/18/97		16:15		COPY - ORIGINAL ON FILE							
																DATE & TIME FILED 10/18/97							



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

000005

PROJ. NO.		PROJECT NAME																					
61524711		Balcony River Resident fish																					
SAMPLERS: (Signature)		[Signature]																					
STA. NO.	DATE	TIME	COMP.	XERAB	STATION LOCATION	Whole Fish	Number of Containers	X FBS (Arctic)	X FBS (Lipids)	REMARKS													
K40543	10/14/97	15:00		X	New Richmond ABSA #11 Adult Carp	1		X	X	Fillet and a carp (skin-off fillets) and bass (skin-on, scales-on) and analyze fillets following analytical procedures discussed previously.													
K40544	10/14/97	15:00		X	New Richmond ABSA #11 Adult Carp			X	X														
K40545																							
K40546																							
K40547																							
K40548																							
K40549																							
K40550																							
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)					DATE	TIME	Relinquished by: (Signature)				
[Signature]					10/17/97	16:30																	
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)					DATE	TIME	Relinquished by: (Signature)				
Relinquished by: (Signature)					DATE	TIME	Received for Laboratory by: (Signature)					DATE	TIME	Remarks:									

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH04

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH04 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40573	345521	tissue	10/21/97			x		x
K40574	345522	tissue	10/21/97			x		x
K40551-C	345523	tissue	10/20/97			x		x
K40564-C	345524	tissue	10/21/97			x		x
K40565-C	345525	tissue	10/21/97			x		x
K40566-C	345526	tissue	10/21/97			x		x
K40567-C	345527	tissue	10/21/97			x		x
K40558	345528	tissue	10/20/97			x		x
K40559	345529	tissue	10/20/97			x		x
K40560	345530	tissue	10/20/97			x		x
K40561	345531	tissue	10/20/97			x		x
K40562	345532	tissue	10/20/97			x		x
K40563	345533	tissue	10/20/97			x		x
K40575	345534	tissue	10/21/97			x		x
K40576	345535	tissue	10/21/97			x		x
K40577	345536	tissue	10/21/97			x		x
K40578	345537	tissue	10/21/97			x		x
K40579	345538	tissue	10/21/97			x		x
K40580	345539	tissue	10/21/97			x		x
K40582	345540	tissue	10/21/97			x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for one surrogate was below control limits in samples K40565-C, K40566-C and K40567-C. Since recoveries for the remaining surrogate were within control limits, no data has been qualified based on the deviations. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>0</u> out of <u>4</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>0</u> out of <u>2</u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u> X </u>	<u> </u>
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	<u> </u>	<u> </u>	<u> X </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40573			
K40574			
K40551-C			
K40564-C			
K40565-C			
K40566-C			
K40567-C			
K40558			
K40559			
K40560			
K40561			
K40562			
K40563			
K40575			
K40576			
K40577			
K40578			
K40579			
K40580			
K40582			

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 : Recovery high
 ! Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40574

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345522

Phase Weight: 10.3 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	130	
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	53	

REVISIT
APR 08 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40551-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345523

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 2.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	100	U
12672-29-6	Aroclor-1248	100	U
11097-69-1	Aroclor-1254	220	
11096-82-5	Aroclor-1260	100	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40564-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345524

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 5.0

Date Analyzed: 03/05/98

% Solids: 100% 418 K8

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	U
11104-28-2	Aroclor-1221	250	U
11141-16-5	Aroclor-1232	250	U
53469-21-9	Aroclor-1242	250	U
12672-29-6	Aroclor-1248	950	
11097-69-1	Aroclor-1254	640	
11096-82-5	Aroclor-1260	220	J

REVISIT
APR 08 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40565-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345525

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 10.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	500	U
12672-29-6	Aroclor-1248	700	
11097-69-1	Aroclor-1254	440	J
11096-82-5	Aroclor-1260	500	U

REVISE
APR 08 1998

By Klc

000045

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40566-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345526

Phase Weight: 10.1 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 3.0

Date Analyzed: 03/05/98

% Solids: 100 *KK* 4/5/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	670	
11097-69-1	Aroclor-1254	660	
11096-82-5	Aroclor-1260	170	

REVISE
APR 08 1998

By *KK*

000054

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40567-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345527

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 2.0

Date Analyzed: 03/05/98

% Solids: 100 *KL* 2/19/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	100	U
12672-29-6	Aroclor-1248	320	
11097-69-1	Aroclor-1254	190	
11096-82-5	Aroclor-1260	100	U

REVISED
APR 08 1998

By *KL*

000063

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40558

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345528

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 KPC 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	72	
11096-82-5	Aroclor-1260	50	U

REVISED
APR 08 1998

By KPC

000072

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40559

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345529

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/18/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-3	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	28	J
11096-82-5	Aroclor-1260	50	U

REVIEW
APR 08 1998

By

000081

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40560

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345530

Phase Weight: 10.2 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 *KE* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	49	U
11097-69-1	Aroclor-1254	78	
11096-82-5	Aroclor-1260	49	U

REVISIT
APR 08 1998

by *KE*
000090

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40561

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345531

Phase Weight: 10.2 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 300 *YPC* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	49	U
11097-69-1	Aroclor-1254	100	
11096-82-5	Aroclor-1260	72	

REVIS
APR 08 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40562

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345532

Phase Weight: 10.1 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 *KPC* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	44	J
11096-32-5	Aroclor-1260	50	U

REVISE
APR 08 1998
By *KPC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40563

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345533

Phase Weight: 10.1 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% *KK* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	83	
11096-82-5	Aroclor-1260	50	U

REVIS
APR 08 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40575

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345534

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 3.0

Date Analyzed: 03/05/98

% Solids: 100% *KPC* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	150	U

REVISE
APR 08 1998

By *KPC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40576

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH04</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345535</u>	
Phase Weight:	<u>10.0</u>	Date Received:	<u>10/23/97</u>	
Injection Volume:	<u>1.0</u>	Date Extracted:	<u>02/23/98</u>	
Dilution Factor:	<u>1.0</u>	Date Analyzed:	<u>03/05/98</u>	
% Solids:	<u>300 KPC 4/8/98</u>	Sulfur Clean-up:	<u>Y</u>	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	180	
11097-69-1	Aroclor-1254	140	
11096-82-5	Aroclor-1260	34	J

REVISED
APR 08 1998

By KPC 000134

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40577

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345536

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	140	
11097-69-1	Aroclor-1254	150	
11096-82-5	Aroclor-1260	31	J

REVIS
APR 08 1998
By *KPC*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40578

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345537

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 KR 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	130	
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	250	
11096-82-5	Aroclor-1260	50	U

REVIS
APR 08 1998

By KRC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40579

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345538

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 KPC 418 KPC

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	98	
11097-69-1	Aroclor-1254	170	
11096-82-5	Aroclor-1260	33	J

REVISE
APR 08 1998

By KPC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40580

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345539

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 KPC 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	J
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	110	
11096-82-5	Aroclor-1260	50	U

REVISE
APR 08 1998

By KPC

000170

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40581

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345540

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	150	
11097-69-1	Aroclor-1254	160	
11096-32-5	Aroclor-1260	50	U

REVISE
APR 08 1998

By KFC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40581MS

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345540MS

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 10.0

Date Analyzed: 03/05/98

% Solids: 100 KRC 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	6100	
12672-29-6	Aroclor-1248	500	U
11097-69-1	Aroclor-1254	6200	
11096-82-5	Aroclor-1260	500	U

REVIS
APR 08 1998
By KRC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40581MSD

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345540MD

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 10.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	5400	
12672-29-6	Aroclor-1248	500	U
11097-69-1	Aroclor-1254	5500	
11096-82-5	Aroclor-1260	500	U

REVISE
APR 08 1998

By Klee

ITS Environmental 55 South Park Drive Colchester, Vermont 05446

Telephone (802) 655-1203

Fax (802) 655-1248

0005

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result
K40574	345522	tissue	0.3%
K40551-C	345523	tissue	1.5%
K40564-C	345524	tissue	2.4%
K40565-C	345525	tissue	2.9%
K40566-C	345526	tissue	2.2%
K40567-C	345527	tissue	3.2%
K40558	345528	tissue	0.6%
K40559	345529	tissue	0.2%
K40560	345530	tissue	0.4%
K40561	345531	tissue	0.3%
K40562	345532	tissue	0.4%
K40563	345533	tissue	0.3%
K40575	345534	tissue	0.5%
K40576	345535	tissue	0.6%
K40577	345536	tissue	0.4%
K40578	345537	tissue	0.7%
K40579	345538	tissue	0.3%
K40580	345539	tissue	0.4%
K40582	345540	tissue	0.4%

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UU The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed beyond the specified holding time. Based on the deviation, all data has been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for one surrogate was below control limits in samples K40506, K40512 and K40515. Since recoveries for the remaining surrogate were within control limits, no data has been qualified based on the deviations. Recovery for both surrogates were above control limits in the extraction blank. Since surrogate recoveries for all samples associated with the blank were acceptable, no action has been taken based on the deviation. Surrogates were diluted beyond the range of detection in sample K40509. No data has been qualified based on diluted surrogates.

All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u> </u>	<u>X</u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u> </u>	<u>X</u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u> X </u>	<u> </u>
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	<u> </u>	<u> </u>	<u> X </u>

**PCB Holding Time and Surrogate
Recovery Summary**

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40500	+5		
K40502	+5		
K40503C	+5		
K40506	+5		
K40507	+5		
K40508K	+5		
K40509	+5	D	D
K40511	+5		
K40512	+5	:	
K40513	+5		
K40514	+5		
K40515	+5	:	
K40516	+5		
K40504-C1	+5		
K40504-C2	+5		
K40504-C	+5		
K40517-C	+10		
K40518-C	+10		
K40519-C	+10		
K40520-C	+10		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 : Recovery high
 : Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

PCB Calibration Summary - Page 2

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

PCB Calibration Summary - Page 3

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date:	2/04/98- 2/05/98	2/05/98	2/05/98					
Time		1308	1335					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok						
Aroclor 1254	ok							
Aroclor 1260	ok							
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40500

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345205

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 01/31/98

% Solids: 100 *AK*
4/10/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	<i>✓</i> <i>515</i>
11104-28-2	Aroclor-1221	100	<i>✓</i> <i>515</i>
11141-16-5	Aroclor-1232	100	<i>✓</i> <i>515</i>
53469-21-9	Aroclor-1242	100	<i>✓</i> <i>515</i>
12672-29-6	Aroclor-1248	330	<i>✓</i> <i>515</i>
11097-69-1	Aroclor-1254	450	<i>✓</i> <i>515</i>
11096-82-5	Aroclor-1260	94	<i>✓</i> <i>515</i>

REVIEW
APR 06 1998

By *Kle*

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40502

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345207

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 01/31/98

% Solids: 100
100

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 5
11104-28-2	Aroclor-1221	50	✓ 5
11141-16-5	Aroclor-1232	50	✓ 5
53469-21-9	Aroclor-1242	50	✓ 5
12672-29-6	Aroclor-1248	290	
11097-69-1	Aroclor-1254	330	✓ 5
11096-82-5	Aroclor-1260	59	✓ 5

REVISE
APR 06 1998

By KRE

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40503C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345208

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 01/31/98

% Solids: 200 μ thick

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12574-11-2	Aroclor-1016	100	✓ 5
11104-28-2	Aroclor-1221	100	✓ 5
11141-16-5	Aroclor-1232	100	✓ 5
53469-21-9	Aroclor-1242	100	✓ 5
12572-29-6	Aroclor-1248	100	✓ 5
11097-69-1	Aroclor-1254	1000	✓ 5
11096-82-5	Aroclor-1260	97	✓

REVISED
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40506

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345209

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 10.0

Date Analyzed: 01/31/98

% Solids: 100% ~~100%~~

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	✓ 13
11104-28-2	Aroclor-1221	500	✓ 13
11141-16-5	Aroclor-1232	500	✓ 13
53469-21-9	Aroclor-1242	500	✓ 13
12672-29-6	Aroclor-1248	500	✓ 13
11097-69-1	Aroclor-1254	3200	✓ 13
11096-82-5	Aroclor-1260	290	✓ 13

REVIS
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40507

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345210

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 01/31/98

% Solids: 100
dry

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	85
11104-28-2	Aroclor-1221	100	85
11141-16-5	Aroclor-1232	100	85
53469-21-9	Aroclor-1242	100	85
12672-29-6	Aroclor-1248	470	45
11097-69-1	Aroclor-1254	630	45
11096-82-5	Aroclor-1260	180	45

REVISED
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40508

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345211

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 10.0

Date Analyzed: 01/31/98

% Solids: ~~100~~ *100* *10/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	✓ <i>5/5/98</i>
11104-28-2	Aroclor-1221	500	✓ <i>5/5/98</i>
11141-16-5	Aroclor-1232	500	✓ <i>5/5/98</i>
53469-21-9	Aroclor-1242	500	✓ <i>5/5/98</i>
12672-29-6	Aroclor-1248	500	✓ <i>5/5/98</i>
11097-69-1	Aroclor-1254	4900	✓ <i>5/5/98</i>
11096-82-5	Aroclor-1260	1000	✓ <i>5/5/98</i>

REVISE
APR 06 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40509

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	SDG:	<u>FISH01</u>
Contract:	<u>91082</u>	Case:	<u>PCB</u>		
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345212</u>		
Phase Weight:	<u>10.0</u>	(g)	Date Received:	<u>10/16/97</u>	
Injection Volume:	<u>1.0</u>	(uL)	Date Extracted:	<u>12/17/97</u>	
Dilution Factor:	<u>20.0</u>		Date Analyzed:	<u>01/31/98</u>	
% Solids:	<u>100 μg ^{μg}</u>		Sulfur Clean-up:	<u>Y</u>	(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	1000	R 13
11104-28-2	Aroclor-1221	1000	R 13
11141-16-5	Aroclor-1232	1000	R 13
53469-21-9	Aroclor-1242	3000	R 13
12672-29-6	Aroclor-1248	1000	R 13
11097-69-1	Aroclor-1254	13000	R 13
11096-82-5	Aroclor-1260	1300	R 13

REVISE
APR 06 1998

By KRC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40511

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345214

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 01/31/98

% Solids: 200 μ 10%
210 μ 10%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	✓ 13
11104-28-2	Aroclor-1221	250	✓ 13
11141-16-5	Aroclor-1232	250	✓ 13
53469-21-9	Aroclor-1242	250	✓ 13
12672-29-6	Aroclor-1248	1100	✓ 13
11097-69-1	Aroclor-1254	1500	✓ 13
11096-82-5	Aroclor-1260	340	✓ 13

REVIEW
APR 06 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40512

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345215

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 10.0

Date Analyzed: 01/31/98

% Solids:

100% solids

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	4 5
11104-28-2	Aroclor-1221	500	4 5
11141-16-5	Aroclor-1232	500	4 5
53469-21-9	Aroclor-1242	500	4 5
12672-29-6	Aroclor-1248	500	4 5
11097-69-1	Aroclor-1254	5200	4 5
11096-82-5	Aroclor-1260	810	4 5

REVISED
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40513

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345216

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 01/31/98

% Solids: ~~100~~ *100*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R <i>13</i>
11104-28-2	Aroclor-1221	50	R <i>13</i>
11141-16-5	Aroclor-1232	50	R <i>13</i>
53469-21-9	Aroclor-1242	50	R <i>13</i>
12672-29-6	Aroclor-1248	330	
11097-69-1	Aroclor-1254	310	
11096-82-5	Aroclor-1260	80	

REVIEW
APR 06 1998
E, *KPC*

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40514

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345217

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 01/31/98

% Solids: 20% w/w

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 13
11104-28-2	Aroclor-1221	50	✓ 13
11141-16-5	Aroclor-1232	50	✓ 13
53469-21-9	Aroclor-1242	50	✓ 13
12572-29-6	Aroclor-1248	530	✓ 13
11097-69-1	Aroclor-1254	370	✓ 13
11096-82-5	Aroclor-1260	71	✓ 13

REVISE
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40515

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345218

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 10.0

Date Analyzed: 01/31/98

% Solids: *100% K40515*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	<i>13</i>
11104-28-2	Aroclor-1221	500	<i>13</i>
11141-16-5	Aroclor-1232	500	<i>13</i>
53469-21-9	Aroclor-1242	500	<i>13</i>
12672-29-6	Aroclor-1248	1500	
11097-69-1	Aroclor-1254	2100	<i>13</i>
11096-82-5	Aroclor-1260	560	<i>13</i>

REVISE
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40516

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345219

Phase Weight: 10.0 (g)

Date Received: 10/16/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 01/31/98

% Solids: 100% ~~100%~~ 100%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	# B
11104-28-2	Aroclor-1221	250	# B
11141-16-5	Aroclor-1232	250	# B
53469-21-9	Aroclor-1242	250	# B
12672-29-6	Aroclor-1248	250	# B
11097-69-1	Aroclor-1254	2000	# H
11096-82-5	Aroclor-1260	350	# H

REVISE
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40504-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345420

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 01/31/98

% Solids: 100% ~~20/198~~

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	✓
11104-28-2	Aroclor-1221	150	✓
11141-16-5	Aroclor-1232	150	✓
53469-21-9	Aroclor-1242	150	✓
12672-29-6	Aroclor-1248	590	
11097-69-1	Aroclor-1254	700	
11096-82-5	Aroclor-1260	150	

REVISE
APR 06 1998

By KAC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40517-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345421

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/05/98

% Solids: 100% *100% AS*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	F <i>5/13/97</i>
11104-28-2	Aroclor-1221	50	F <i>5/13/97</i>
11141-16-5	Aroclor-1232	50	F <i>5/13/97</i>
53469-21-9	Aroclor-1242	50	F <i>5/13/97</i>
12672-29-6	Aroclor-1248	50	F <i>5/13/97</i>
11097-69-1	Aroclor-1254	200	F <i>5/13/97</i>
11096-82-5	Aroclor-1260	39	J

REVISED
APR 06 1998

By *KPC*

FORM 1
AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40518-C

Lab Name: <u>ITS Environmental</u>	Lab Code: <u>INCHVT</u>	
Contract: <u>91082</u>	Case: <u>PCB</u>	SDG: <u>FISH01</u>
Phase Type: <u>BIOTA</u>	Lab Sample ID: <u>345422</u>	
Phase Weight: <u>10.0</u> (g)	Date Received: <u>10/18/97</u>	
Injection Volume: <u>1.0</u> (uL)	Date Extracted: <u>12/17/97</u>	
Dilution Factor: <u>1.0</u>	Date Analyzed: <u>02/05/98</u>	
% Solids: <u>100% <i>KL</i></u>	Sulfur Clean-up: <u>Y</u> (Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	<i>KL</i>
11104-28-2	Aroclor-1221	50	<i>KL</i>
11141-16-5	Aroclor-1232	50	<i>KL</i>
53469-21-9	Aroclor-1242	50	<i>KL</i>
12672-29-6	Aroclor-1248	50	<i>KL</i>
11097-69-1	Aroclor-1254	310	<i>KL</i>
11096-82-5	Aroclor-1260	58	<i>KL</i>

REVIS.
APR 06 1998

By *KL*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40519-C

Lab Name: ITS Environmental Lab Code: INCHVT
 Contract: 91082 Case: PCB SDG: FISH01
 Phase Type: BIOTA Lab Sample ID: 345423
 Phase Weight: 10.0 (g) Date Received: 10/18/97
 Injection Volume: 1.0 (uL) Date Extracted: 12/17/97
 Dilution Factor: 1.0 Date Analyzed: 02/05/98
 % Solids: 100% 10/19/98 Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 5
11104-28-2	Aroclor-1221	50	✓ 5
11141-16-5	Aroclor-1232	50	✓ 5
53469-21-9	Aroclor-1242	50	✓ 5
12672-29-6	Aroclor-1248	50	✓ 5
11097-69-1	Aroclor-1254	230	✓ 4
11096-82-5	Aroclor-1260	43	✓

REVISE
APR 06 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40520-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH01

Phase Type: BIOTA

Lab Sample ID: 345424

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/05/98

% Solids: 100 *KK* *4/6/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R <i>5</i>
11104-28-2	Aroclor-1221	50	R <i>5</i>
11141-16-5	Aroclor-1232	50	R <i>5</i>
53469-21-9	Aroclor-1242	50	R <i>5</i>
12672-29-6	Aroclor-1248	50	R <i>5</i>
11097-69-1	Aroclor-1254	210	R <i>5</i>
11096-82-5	Aroclor-1260	36	J

REVIS
APR 06 1998

PERCENT LIPID ANALYSES

Percent Lipids Results

[illegible]

CHAIN OF CUSTODY

CHAIN OF CUSTODY RECORD

000004

PROJ. NO.		PROJECT NAME		NO OF CONTAINERS		<div style="display: flex; justify-content: space-around;"> <div>Whole Fish</div> <div>PCBs (Aroclor)</div> <div>3 Lipids</div> </div>						REMARKS	
SAMPLERS: (Signature)													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
K 40500	10/11/97	1310		X	New Richmond - ABSA #11	1	X	X					Fillet and analyze following analytical procedures discussed previously
K 40501				X									
K 40502				X									
K 40503			X										Analyze whole-body composite as described above
K 40504			X										Retain for combination w/ additional samples
K 40512				X									Fillet and analyze following analytical procedures discussed previously
K 40513													
K 40514													
K 40515													
K 40516													

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
<i>Kel D. Phay</i>	10/15/97 17:50				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		<i>Sharon M. Nix</i>	10/14/97 0930		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

COPY - ORIGINAL ON FILE

SDG # 5151101 ETR # 101792



BLASLAND & BOUCH
ENGINEERS, P.C.

000005

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME		NO OF CONTAINERS		REMARKS					
SAMPLERS: (Signature)											
STA. NO.	DATE	TIME	8	GRAB	STATION LOCATION	Whole Fish	PCBs (Aroclor)	PAHs	Lipids		
K 40500	10/11/97	1310		X	New Richmond - ABSA #11	X	X				
K 40501				X							
K 40502				X							
K 40503			X								
K 40504			X								
K 40512				X							
K 40513											
K 40514											
K 40515											
K 40516											
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
K 40516		10/15/97 17:50									
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks			
				Steven J. Linares		10/14/97 09:30					

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files



00000

PROJ. NO.		PROJECT NAME		NO OF CONTAINERS		REMARKS	
6:1524711		K2 on River Resident Fish					
SAMPLERS: (Signature)							
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION		
K 40506	10/14/57	12:30		X	New Richmond AGSA #11	Fillet and analyze skin off lobes following analytical procedures discussed previously	
K 40507							
K 40508							
K 40509							
K 40510							
K 40511							
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time	
K 40511		10/15/57 16:40					
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time	
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time	
				K 40511			

Distribution Original Accompanies Shipment; Easy to Coordinate Field Piles

6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 448-9120

CHAIN OF CUSTODY RECORD

200000

PROJ. NO.		PROJECT NAME				Whole Fish		Number of Containers		PLBs (Preserved)		Remarks	
6824711		Kalamazoo River Resident Fish											
SAMPLERS: (Signature)													
Karl D. Stettin													
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION								
40504-C2	10/11/97	14:00	X		New Richmond ABSA #11 Juvenile SM Bass	1	X	X					Combine K40504-C2 with K40504-C1 (provided earlier)
40530-C													Process all Juvenile bass composite samples as
40531-C													whole-body composites and analyze following analytical
40532-C													procedures discussed previously:
40533-C	10/11/97	10:00	X		Lake Michigan ABSA #9 Juvenile SM Bass								
40534-C1	"	"	"	"	"								* 40534 Return C-1 to combine with 40534 C-2 which will follow at Lake Michigan
40535	10/17/97	10:00		X	Lake Allegan ABSA #9 Adult Carp	1	X	X					Fillet carp (skin-off fillets) and bass (skin-on, scales-on fillets) and analyze fillets following analytical procedures discussed previously
K40536													
K40537													
K40538													
K40539													
K40540					Lake Allegan ABSA #9 Adult Bass								
K40541													
K40542													
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)	
Karl D. Stettin					10/17/97	16:30							
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)	
Relinquished by: (Signature)					DATE	TIME	Received for Laboratory by: (Signature)					Remarks:	
							Sharon Nicks					10/17/97 1645	

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO OF CON- TAINERS	Whole Fish	PCBs (Aroclors)	% Lipids							REMARKS
GAS 24 711		Kalamazoo River - Resident Fish														
SAMPLERS: (Signature)																
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION											
K10517-L	10/15		X		Juvenile Sm Bass MORROW Pond - AB5A #2	1	X	X							Analyze whole body comp. to samples fillet and analyze following analytical procedures discussed previously.	
K10518-L	10/15		X													
K10519-L	10/15		X													
K10520-L	10/15		X													
K10521				X	Marrow Pond Adult Camp AB5A #2										Fillet and analyze following analytical procedures discussed previously.	
K10522																
K10523															comp (skin-off fillets) Sm Bass (skin-on, scales-on fillets).	
K10524																
K10525																
K10526																
K10527					Marrow Pond Adult AB5A #2 Sm Bass											
K10528																
K10529																
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)			
			10/17/97 16:50													
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)			
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time			Remarks					
								10/18/97 1445								

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH02

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH02 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40521	345425	tissue	10/15/97			x		x
K40522	345426	tissue	10/15/97			x		x
K40523*	345427	tissue	10/15/97			x		x
K40525	345429	tissue	10/15/97			x		x
K40526	345430	tissue	10/15/97			x		x
K40527	345431	tissue	10/15/97			x		x
K40528	345432	tissue	10/15/97			x		x
K40529	345433	tissue	10/15/97			x		x
K40530-C	345434	tissue	10/15/97			x		x
K40531-C	345435	tissue	10/16/97			x		x
K40532-C	345436	tissue	10/16/97			x		x
K40533-C	345437	tissue	10/16/97			x		x
K40535	345438	tissue	10/17/97			x		x
K40536	345439	tissue	10/17/97			x		x
K40537	345440	tissue	10/17/97			x		x
K40538	345441	tissue	10/17/97			x		x
K40539	345442	tissue	10/17/97			x		x
K40540	345443	tissue	10/17/97			x		x

* MS/MSD performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples except K40523, K40523MS and K40523MSD were analyzed beyond the specified holding time. Based on the deviation, data for all samples except K40523, K40523MS and K40523MSD have been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for both surrogates were above control limits in the extraction blank. Since recoveries for all samples associated with the blank were acceptable, no action has been taken based on the deviation.

All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	_____	_____	_____X_____
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	_____X_____	_____	_____
<u>Chromatogram Quality</u>			
Were the baselines stable?	_____X_____	_____	_____
Were any electronegative displacement (negative peaks) or unusual peaks detected?	_____	_____X_____	_____
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	_____	_____	_____X_____

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40521	+28		
K40522	+28		
K40523			
K40523MS			
K40523MSD			
K40525	+28		
K40526	+28		
K40527	+28		
K40528	+28		
K40529	+28		
K40530-C	+28		
K40531-C	+28		
K40532-C	+28		
K40533-C	+28		
K40535	+25		
K40536	+25		
K40537	+25		
K40538	+25		
K40539	+25		
K40540	+25		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 † Recovery high
 ‡ Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date	2/04/98- 2/05/98	2/05/98	2/05/98					
Time		1308	1335					
	Initial Cal.	Cont. Cal.	Cont. Cal.					
	%RSD	%D	%D					
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok						
Aroclor 1254	ok							
Aroclor 1260	ok							
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

PCB Calibration Summary - Page 2

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date:	2/18/98- 2/19/98	2/19/98	2/19/98	2/20	2/20	2/20	2/20	2/20
Time:		1957	2023	0141	0207	1853	1919	2251
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok							
Aroclor 1248	ok	ok		ok		ok		ok
Aroclor 1254	ok		ok					
Aroclor 1260	ok				ok		ok	
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

PCB Calibration Summary - Page 3

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date:	2/18/98- 2/19/98	2/20/98	2/23/98	2/23	2/23	2/23	2/23	2/23
Time:		2317	1202	1229	1745	1812	2329	2355
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok	ok						ok
Aroclor 1248	ok		ok		ok		ok	
Aroclor 1254	ok			ok				
Aroclor 1260	ok					ok		
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

CORRECTED ANALYSIS SUMMARY FORMS

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40521

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345425

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100% ATLAS

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R M
11104-28-2	Aroclor-1221	50	R M
11141-16-5	Aroclor-1232	50	R M
53469-21-9	Aroclor-1242	50	R M
12672-29-6	Aroclor-1248	50	R M
11097-69-1	Aroclor-1254	28	J
11096-82-5	Aroclor-1260	33	J

REVISE
APR 07 1998

By Kle

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40522

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345426

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100% (K40522)

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	#
11104-28-2	Aroclor-1221	50	#
11141-16-5	Aroclor-1232	50	#
53469-21-9	Aroclor-1242	50	#
12672-29-6	Aroclor-1248	50	#
11097-69-1	Aroclor-1254	130	#
11096-82-5	Aroclor-1260	25	J

REVISL
APR 07 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40523

Lab Name: ITS Environmental

Lab Code: iNCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345427

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 01/16/98

Dilution Factor: 3.0

Date Analyzed: 02/19/98

% Solids: 100% *4/11/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	150	U
11096-82-5	Aroclor-1260	150	U

REVISED
APR 07 1998

By *Kle*

FORM 1
AROCLOL ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40525

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345429

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100% ~~100~~ 1198

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R 13
11104-28-2	Aroclor-1221	50	R 13
11141-16-5	Aroclor-1232	50	R 13
53469-21-9	Aroclor-1242	50	R 13
12672-29-6	Aroclor-1248	50	R 13
11097-69-1	Aroclor-1254	73	R 13
11096-82-5	Aroclor-1260	30	J

REVIS
APR 07 1998
By KE

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40526

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345430

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 200 ~~41~~ 41.14%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	B
11104-28-2	Aroclor-1221	50	B
11141-16-5	Aroclor-1232	50	B
53469-21-9	Aroclor-1242	50	B
12672-29-6	Aroclor-1248	50	B
11097-69-1	Aroclor-1254	150	H
11096-82-5	Aroclor-1260	38	J

REVISED
APR 07 1998

By KRC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40527

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345431

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 105% 47.14%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R 13
11104-28-2	Aroclor-1221	50	R 13
11141-16-5	Aroclor-1232	50	R 13
53469-21-9	Aroclor-1242	50	R 13
12672-29-6	Aroclor-1248	50	R 13
11097-69-1	Aroclor-1254	280	R 13
11096-82-5	Aroclor-1260	63	R 13

REVIS
APR 07 1998

By KCC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40528

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345432

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100% 417K

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# 12
11104-28-2	Aroclor-1221	50	# 12
11141-16-5	Aroclor-1232	50	# 12
53469-21-9	Aroclor-1242	50	# 12
12672-29-6	Aroclor-1248	50	# 12
11097-69-1	Aroclor-1254	120	# 12
11096-82-5	Aroclor-1260	35	J

REVISE
APR 07 1998

By Kec

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40529

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345433

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/23/98

% Solids: 100 ~~41~~ 41.74

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	4 6
11104-28-2	Aroclor-1221	50	4 6
11141-16-5	Aroclor-1232	50	4 6
53469-21-9	Aroclor-1242	50	4 6
12672-29-6	Aroclor-1248	50	4 6
11097-69-1	Aroclor-1254	110	4 6
11096-82-5	Aroclor-1260	50	4 6

REVISL
APR 07 1998

By KLC

000075

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40530-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345434

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/23/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	4
11104-28-2	Aroclor-1221	150	4
11141-16-5	Aroclor-1232	150	4
53469-21-9	Aroclor-1242	150	4
12672-29-6	Aroclor-1248	480	
11097-69-1	Aroclor-1254	640	
11096-82-5	Aroclor-1260	150	4

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40531-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345435

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/23/98

% Solids: 100% 41748

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12574-11-2	Aroclor-1016	150	4
11104-28-2	Aroclor-1221	150	4
11141-16-5	Aroclor-1232	150	11
53469-21-9	Aroclor-1242	150	4
12672-29-6	Aroclor-1248	560	
11097-69-1	Aroclor-1254	600	
11096-82-5	Aroclor-1260	140	J

REVISED
APR 07 1998

By KKC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40532-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345436

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/23/98

% Solids: 100% 2/17/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	P
11104-28-2	Aroclor-1221	150	P
11141-16-5	Aroclor-1232	150	P
53469-21-9	Aroclor-1242	150	P
12672-29-6	Aroclor-1248	560	
11097-69-1	Aroclor-1254	780	
11096-32-5	Aroclor-1260	150	P

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40533-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345437

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 02/23/98

% Solids: 100% *4/1/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	# 5/5
11104-28-2	Aroclor-1221	250	# 5/5
11141-16-5	Aroclor-1232	250	# 5/5
53469-21-9	Aroclor-1242	250	# 5/5
12672-29-6	Aroclor-1248	1500	
11097-69-1	Aroclor-1254	900	# 5/5
11096-82-5	Aroclor-1260	260	# 5/5

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40535

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH02</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345438</u>	
Phase Weight:	<u>10.0</u>	(g)	Date Received:	<u>10/18/97</u>
Injection Volume:	<u>1.0</u>	(uL)	Date Extracted:	<u>12/17/97</u>
Dilution Factor:	<u>5.0</u>		Date Analyzed:	<u>02/20/98</u>
% Solids:	<u>100 47.4%</u>		Sulfur Clean-up:	<u>Y</u> (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	# 5
11104-28-2	Aroclor-1221	250	# 5
11141-16-5	Aroclor-1232	250	# 5
53469-21-9	Aroclor-1242	250	# 5
12672-29-6	Aroclor-1248	600	# 5
11097-69-1	Aroclor-1254	700	# 5
11096-82-5	Aroclor-1260	190	J

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40536

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345439

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/20/98

% Solids: 100% ~~41%~~

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	120	
11097-69-1	Aroclor-1254	160	
11096-82-5	Aroclor-1260	76	

REVISED
APR 07 1998

By KFC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40537

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345440

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 02/20/98

% Solids: 200 *ll* 417K8

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	<i>H</i> <i>13</i>
11104-28-2	Aroclor-1221	100	<i>H</i> <i>13</i>
11141-16-5	Aroclor-1232	100	<i>H</i> <i>13</i>
53469-21-9	Aroclor-1242	100	<i>H</i> <i>13</i>
12672-29-6	Aroclor-1248	100	<i>H</i> <i>13</i>
11097-69-1	Aroclor-1254	350	<i>H</i>
11096-82-5	Aroclor-1260	95	<i>J</i>

REVISE
APR 07 1998

By *ll*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40538

Lab Name: ITS Environmental

Lab Code: WCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345441

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/20/98

% Solids: 100% AHHH

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	5
11104-28-2	Aroclor-1221	50	5
11141-16-5	Aroclor-1232	50	5
63469-21-9	Aroclor-1242	50	5
12672-29-6	Aroclor-1248	130	
11097-69-1	Aroclor-1254	50	5
11096-82-5	Aroclor-1260	130	5

REVIS
APR 07 1998

By Vee

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40539

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH02

Phase Type: BIOTA

Lab Sample ID: 345442

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 02/20/98

% Solids: 100% 4/19/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12574-11-2	Aroclor-1016	100	13
11104-28-2	Aroclor-1221	100	13
11141-16-5	Aroclor-1232	100	13
53469-21-9	Aroclor-1242	100	13
12572-29-6	Aroclor-1248	320	17
11097-69-1	Aroclor-1254	650	14
11096-82-5	Aroclor-1260	100	13

REVISE
APR 07 1998

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40540

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>WCHVT</u>	SDG:	<u>FISH02</u>
Contract:	<u>91082</u>	Case:	<u>PCB</u>		
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345443</u>		
Phase Weight:	<u>10.0</u> (g)	Date Received:	<u>10/18/97</u>		
Injection Volume:	<u>1.0</u> (uL)	Date Extracted:	<u>12/17/97</u>		
Dilution Factor:	<u>3.0</u>	Date Analyzed:	<u>02/20/98</u>		
% Solids:	<u>100% 117%</u>	Sulfur Clean-up:	<u>Y</u> (Y/N)		

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	u
11104-28-2	Aroclor-1221	150	u
11141-16-5	Aroclor-1232	150	u
53469-21-9	Aroclor-1242	150	u
12672-29-6	Aroclor-1248	680	
11097-69-1	Aroclor-1254	900	
11096-82-5	Aroclor-1260	150	u

REVI
APR 07 1998

By KE

PERCENT LIPID ANALYSES

Percent Lipids Results

[illegible]

CHAIN OF CUSTODY



BLASLAND & BOUCK
ENGINEERS, P.C.

000003

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO OF CON- TAINERS	Whole Fish	PCBs (Aroclors)	% Lipids							REMARKS
SAMPLERS: (Signature)																
STA. NO.	DATE	TIME	CONS	GRAB	STATION LOCATION											
K10517-L	10/15		X		MORRISON Pond - ABSA # 2	1	X	X								Analyze whole body composite samples fillet and analyze following analytical procedures discussed previously.
K10518-L	10/15		X													
K10519-L	10/15		X													
K10520-L	10/15		X													
K10521				X	MORRISON Pond Adult Carp ABN#2											Fillet and analyze following analytical procedures discussed previously comp (skin-off fillets) SM Asses (Skin-on, scales-on fillets).
K10522																
K10523																
K10524																
K10525																
K10526																
K10527					MORRISON Pond Adult ABN#2 SM Asses											
K10528																
K10529																

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
	10/17/97 16:50				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
			10/18/97 14:15	COPY - ORIGINAL ON FILE SDG # 815101 ETR # 1052	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 448-9120

CHAIN OF CUSTODY RECORD

000004

PROJ. NO.		PROJECT NAME				Whole Fish		Number of Containers		PCB (Aroclor)		D. Lipids								REMARKS	
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION																
64524711		Kalamazoo River Resident Fish																			
SAMPLERS: (Signature) <i>Karl D. Bouch</i>																					
K 40504-C2	10/11/97	14:00	X		New Richmond ABSA #11 Juvenile Sm Bass	1	X	X												Combine K40504-C2 with K40504-C1 (provided each)	
K 40530-C																				Process all Juvenile bass composite samples as	
K 40531-C																				wholebody composites and analyze following analytical	
K 40532-C																				procedures discussed previously:	
K 40533-C	10/11/97	10:00	X		Lake Michigan ABSA #9 Juvenile Sm Bass																
K 40534-C1	"	"	"	"	"															* K40534	
K 40535	10/17/97	10:00	X		Lake Allegan ABSA #9 Adult Carp	1	X	X												Return C-1 to combine with 40534 C-2 which will follow at 1 date	
K 40536																				Fillet carp (skin-off fillets) and bass (skin-on,	
K 40537																				scales-on fillets) and analyze fillets following	
K 40538																				analytical procedures discussed previously	
K 40539																					
K 40540					Lake Allegan ABSA #9 Adult Bass																
K 40541																					
K 40542																					
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)		DATE		TIME	Relinquished by: (Signature)						
<i>Karl D. Bouch</i>		10/17/97	16:30																		
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		Relinquished by: (Signature)		DATE	TIME	Relinquished by: (Signature)		DATE		TIME	Relinquished by: (Signature)						
Relinquished by: (Signature)		DATE	TIME	Received for Laboratory by: (Signature)		DATE	TIME	Remarks:													
				<i>Sharon Miller</i>		10/18/97	16:45	COPY - ORIGINAL ON FILE													
								SINCE 8 OCT 1997													

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH03

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH03 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40542	345446	tissue	10/17/97			x		x
K40543	345447	tissue	10/16/97			x		x
K40544	345448	tissue	10/16/97			x		x
K40545	345449	tissue	10/16/97			x		x
K40546	345450	tissue	10/16/97			x		x
K40547	345451	tissue	10/16/97			x		x
K40548	345452	tissue	10/16/97			x		x
K40549	345453	tissue	10/16/97			x		x
K40550	345454	tissue	10/16/97			x		x
K40552	345510	tissue	10/20/97			x		x
K40553	345511	tissue	10/20/97			x		x
K40554	345512	tissue	10/20/97			x		x
K40555	345513	tissue	10/20/97			x		x
K40556	345514	tissue	10/20/97			x		x
K40557	345515	tissue	10/20/97			x		x
K40568	345516	tissue	10/21/97			x		x
K40569	345517	tissue	10/21/97			x		x
K40570	345518	tissue	10/21/97			x		x
K40571	345519	tissue	10/21/97			x		x
K40572	345520	tissue	10/21/97			x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed beyond the specified holding time. Based on the deviation, all data has been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries for both surrogates were above control limits in samples K40544 and K40547. All positive data for these samples have been qualified as estimated based on the recoveries. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

Due to a poor chromatographic pattern match, data for Aroclor 1254 in sample K40549, data for Aroclor 1260 in sample K40552 and data for Aroclor 1242 and 1260 in sample K40548 have been qualified as estimated with presumptive evidence of identification.

The Aroclors present in sample K40550 have been misidentified. The correct identifications should be Aroclors 1248, 1254 and 1260. The data have been corrected to reflect the change.

All other Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

No matrix spike/matrix spike duplicate was included in this data set. No evaluation of matrix-specific performance could therefore be performed.

A matrix spike blank was extracted and analyzed with the samples. Since the matrix spike blank demonstrated acceptable recoveries, no action has been taken based on the lack of a matrix spike.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u>X</u>	<u> </u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u> </u>	<u>X</u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u> </u>	<u>X</u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>NA</u> out of <u>NA</u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	_____	_____	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	_____	_____
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	_____	_____
Were any electronegative displacement (negative peaks) or unusual peaks detected?	_____	<u> X </u>	_____
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	_____	_____	<u> X </u>

**PCB Holding Time and Surrogate
Recovery Summary**

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40542	+26		
K40543	+26		
K40544	+29		
K40545	+26		
K40546	+26		
K40547	+29		
K40548	+26		
K40549	+26		
K40550	+26		
K40552	+26		
K40553	+26		
K40554	+26		
K40555	+26		
K40556	+25		
K40557	+26		
K40568	+26		
K40569	+26		
K40570	+26		
K40571	+26		
K40572	+26		

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 ! Recovery high
 : Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
 Column: RTX-35 / RTX-5

Date	2/18/98- 2/19/98	2/20/98	2/20/98	2/21	2/21	2/21	2/21	2/21
Time		2251	2317	0435	0001	1204	1231	1749
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D	%D
Aroclor 1016	ok							
Aroclor 1221	ok							
Aroclor 1232	ok							
Aroclor 1242	ok		ok					
Aroclor 1248	ok	ok		ok		ok		ok
Aroclor 1254	ok				ok			
Aroclor 1260	ok						ok	
Tetrachloro-m-xylene	ok							
Decachlorobiphenyl	ok							
Affected Samples:								

PCB Calibration Summary - Page 2

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40542

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345446

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100 ~~Wt~~ H7M6

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	T
11104-28-2	Aroclor-1221	50	R
11141-16-5	Aroclor-1232	50	R
53469-21-9	Aroclor-1242	50	R
12672-29-6	Aroclor-1248	250	
11097-69-1	Aroclor-1254	170	
11096-82-5	Aroclor-1260	92	

REVISED
APR 07 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40543

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345447

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	13
11104-28-2	Aroclor-1221	50	13
11141-16-5	Aroclor-1232	50	13
53469-21-9	Aroclor-1242	50	13
12672-29-6	Aroclor-1248	170	13
11097-69-1	Aroclor-1254	150	13
11096-82-5	Aroclor-1260	43	13

REVISE
APR 07 1998

By KK

000020

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40544

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345448

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 4.0

Date Analyzed: 02/24/98

% Solids: 100% ~~100%~~ 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	200	✓ 5
11104-28-2	Aroclor-1221	200	✓ 5
11141-16-5	Aroclor-1232	200	✓ 5
53469-21-9	Aroclor-1242	200	✓ 5
12672-29-6	Aroclor-1248	930	✓ 1
11097-69-1	Aroclor-1254	1400	✓ 1
11096-82-5	Aroclor-1260	290	✓ 1

REVISE
APR 07 1998

By KRC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40545

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH03</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345449</u>	
Phase Weight:	<u>10.0</u> (g)	Date Received:	<u>10/18/97</u>	
Injection Volume:	<u>1.0</u> (uL)	Date Extracted:	<u>12/17/97</u>	
Dilution Factor:	<u>1.0</u>	Date Analyzed:	<u>02/21/98</u>	
% Solids:	<u>100% <i>attn</i></u>	Sulfur Clean-up:	<u>Y</u> (Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	<i>u</i>
11104-28-2	Aroclor-1221	50	<i>u</i>
11141-16-5	Aroclor-1232	50	<i>u</i>
53469-21-9	Aroclor-1242	60	<i>u</i>
12672-29-6	Aroclor-1248	50	<i>u</i>
11097-69-1	Aroclor-1254	280	<i>u</i>
11096-82-5	Aroclor-1260	44	<i>u</i>

REVIS
APR 07 1998
By *KR*

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40546

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345450

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/11/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R 6/9
11104-28-2	Aroclor-1221	50	R 6/9
11141-16-5	Aroclor-1232	50	R 6/9
53469-21-9	Aroclor-1242	50	R 6/9
12672-29-6	Aroclor-1248	430	R 4/9
11097-69-1	Aroclor-1254	50	R 6/9
11096-82-5	Aroclor-1260	110	R 4/9

REVISE
APR 07 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40547

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345451

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 4.0

Date Analyzed: 02/24/98

% Solids: 100% *100% 1/1/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	200	# 15
11104-28-2	Aroclor-1221	200	# 15
11141-16-5	Aroclor-1232	200	# 15
53469-21-9	Aroclor-1242	200	# 1
12672-29-6	Aroclor-1248	1300	
11097-69-1	Aroclor-1254	3000	
11096-82-5	Aroclor-1260	200	# 15

REVIS...
APR 07 1998

By *KFC*
00005

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40548

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345452

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 200 LK 2/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 13
11104-28-2	Aroclor-1221	50	✓ 13
11141-16-5	Aroclor-1232	50	✓ 13
53469-21-9	Aroclor-1242	240	✓ 2
12672-29-6	Aroclor-1248	50	✓ 13
11097-69-1	Aroclor-1254	50	✓ 13
11096-82-5	Aroclor-1260	110	✓ 2

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40549

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345453

Phase Weight: 10.0 (g)

Date Received: 10/18/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/21/98

% Solids: 200 KRC 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	B
11104-28-2	Aroclor-1221	150	B
11141-16-5	Aroclor-1232	150	B
53469-21-9	Aroclor-1242	150	B
12672-29-6	Aroclor-1248	150	B
11097-69-1	Aroclor-1254	1000	B
11096-82-5	Aroclor-1260	150	B

REVIS
APR 07 1998

By KRC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40550

Lab Name:	<u>ITS Environmental</u>	Lab Code:	<u>INCHVT</u>	
Contract:	<u>91082</u>	Case:	<u>PCB</u>	SDG: <u>FISH03</u>
Phase Type:	<u>BIOTA</u>	Lab Sample ID:	<u>345454</u>	
Phase Weight:	<u>10.0</u>	(g)	Date Received:	<u>10/18/97</u>
Injection Volume:	<u>1.0</u>	(uL)	Date Extracted:	<u>12/17/97</u>
Dilution Factor:	<u>1.0</u>		Date Analyzed:	<u>02/21/98</u>
% Solids:	<u>100% 41748</u>		Sulfur Clean-up:	<u>Y</u> (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	✓ 5
11104-28-2	Aroclor-1221	50	✓ 5
11141-16-5	Aroclor-1232	50	✓ 5
53469-21-9	Aroclor-1242	50	✓ 5
12672-29-6	Aroclor-1248	270 580	✓ 5
11097-69-1	Aroclor-1254	230 50	✓ 5
11096-82-5	Aroclor-1260	60 120	✓ 5

REVISE
APR 07 1998

By KRC

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40552

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345510

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/21/98

% Solids: 100% 4/7/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	# 15
11104-28-2	Aroclor-1221	150	# 15
11141-16-5	Aroclor-1232	150	# 15
53469-21-9	Aroclor-1242	150	# 15
12672-29-6	Aroclor-1248	150	# 15
11097-69-1	Aroclor-1254	150	# 15
11096-82-5	Aroclor-1260	270	# 15

REVISE
APR 07 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40553

Lab Name:	ITS Environmental	Lab Code:	INCHVT	
Contract:	91082	Case:	PCB	SDG: FISH03
Phase Type:	BIOTA	Lab Sample ID:	345511	
Phase Weight:	10.0 (g)	Date Received:	10/23/97	
Injection Volume:	1.0 (uL)	Date Extracted:	12/17/97	
Dilution Factor:	1.0	Date Analyzed:	02/21/98	
% Solids:	100% <i>KK</i> 4/7/98	Sulfur Clean-up:	Y (Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# <i>51</i>
11104-28-2	Aroclor-1221	50	# <i>51</i>
11141-16-5	Aroclor-1232	50	# <i>51</i>
53469-21-9	Aroclor-1242	50	# <i>51</i>
12672-29-6	Aroclor-1248	50	# <i>51</i>
11097-69-1	Aroclor-1254	87	# <i>41</i>
11096-82-5	Aroclor-1260	34	J

REVISE
APR 07 1998

By *KK*

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40554

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345512

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/21/98

% Solids: 100 *pk 47148*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	R <i>151</i>
11104-28-2	Aroclor-1221	150	R <i>151</i>
11141-16-5	Aroclor-1232	150	R <i>151</i>
53469-21-9	Aroclor-1242	150	R <i>151</i>
12672-29-6	Aroclor-1248	150	R <i>151</i>
11097-69-1	Aroclor-1254	190	<i>44</i>
11096-82-5	Aroclor-1260	460	<i>44</i>

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40555

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345513

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 2.0

Date Analyzed: 02/21/98

% Solids: 100% at 1198

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	✓ B
11104-28-2	Aroclor-1221	100	✓ B
11141-16-5	Aroclor-1232	100	✓ B
53469-21-9	Aroclor-1242	100	✓ B
12672-29-6	Aroclor-1248	100	✓ B
11097-69-1	Aroclor-1254	310	✓ B
11096-82-5	Aroclor-1260	80	J

REVISED
APR 07 1998
By Klc

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40556

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345514

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100 K_{OC} 4/7/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	A 5
11104-28-2	Aroclor-1221	50	A 5
11141-16-5	Aroclor-1232	50	A 5
53469-21-9	Aroclor-1242	50	A
12672-29-6	Aroclor-1248	50	A
11097-69-1	Aroclor-1254	520	A 14
11096-82-5	Aroclor-1260	100	A 14

REVIS_L
APR 07 1998

By K_{OC}

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40557

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345515

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% 4/1/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	R 5
11104-28-2	Aroclor-1221	50	R 5
11141-16-5	Aroclor-1232	50	R 5
53469-21-9	Aroclor-1242	50	R 5
12672-29-6	Aroclor-1248	50	R 5
11097-69-1	Aroclor-1254	140	H
11096-82-5	Aroclor-1260	32	J

REVISE
APR 07 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40568

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345516

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% K40568

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	5
11104-28-2	Aroclor-1221	50	5
11141-16-5	Aroclor-1232	50	5
53469-21-9	Aroclor-1242	50	5
12672-29-6	Aroclor-1248	110	4
11097-69-1	Aroclor-1254	140	4
11096-82-5	Aroclor-1260	58	4

REVISE
APR 07 1998

By KK

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40569

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345517

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 5.0

Date Analyzed: 02/21/98

% Solids: 100% K40569

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	J
11104-28-2	Aroclor-1221	250	R
11141-16-5	Aroclor-1232	250	R
53469-21-9	Aroclor-1242	250	R
12672-29-6	Aroclor-1248	250	R
11097-69-1	Aroclor-1254	1400	
11096-82-5	Aroclor-1260	250	J

REVISED
APR 07 1998

By VLC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40570

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345518

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 3.0

Date Analyzed: 02/21/98

% Solids: 300 ~~CR~~ 41198

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	# 50
11104-28-2	Aroclor-1221	150	# 50
11141-16-5	Aroclor-1232	150	# 50
53469-21-9	Aroclor-1242	150	# 50
12672-29-6	Aroclor-1248	150	# 50
11097-69-1	Aroclor-1254	730	# 41
11096-82-5	Aroclor-1260	180	# 41

REVIS
APR 07 1998
By llc

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40571

Lab Name:	ITS Environmental	Lab Code:	INCHVT	
Contract:	91082	Case:	PCB	SDG: FISH03
Phase Type:	BIOTA	Lab Sample ID:	345519	
Phase Weight:	10.0 (g)	Date Received:	10/23/97	
Injection Volume:	1.0 (uL)	Date Extracted:	12/17/97	
Dilution Factor:	1.0	Date Analyzed:	02/21/98	
% Solids:	100% AMH	Sulfur Clean-up:	Y (Y/N)	

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	5
11104-28-2	Aroclor-1221	50	5
11141-16-5	Aroclor-1232	50	5
53469-21-9	Aroclor-1242	50	5
12672-29-6	Aroclor-1248	150	5
11097-69-1	Aroclor-1254	370	5
11096-82-5	Aroclor-1260	47	J

REVISE
APR 07 1998

By KE

**FORM 1
AROCOR ANALYSIS DATA SHEET**

EPA SAMPLE NO.

K40572

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH03

Phase Type: BIOTA

Lab Sample ID: 345520

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 12/17/97

Dilution Factor: 1.0

Date Analyzed: 02/21/98

% Solids: 100% ALTH

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	# 5/5
11104-28-2	Aroclor-1221	50	# 5/5
11141-16-5	Aroclor-1232	50	# 5/5
53469-21-9	Aroclor-1242	50	# 5/5
12672-29-6	Aroclor-1248	190	# 5/5
11097-69-1	Aroclor-1254	300	# 5/5
11096-82-5	Aroclor-1260	88	# 5/5

REVISI
APR 07 1998
By KK

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result
K40542	345446	tissue	0.4%
K40543	345447	tissue	1.4%
K40544	345448	tissue	0.3%
K40545	345449	tissue	0.8%
K40546	345450	tissue	0.7%
K40547	345451	tissue	0.6%
K40548	345452	tissue	0.3%
K40549	345453	tissue	0.7%
K40550	345454	tissue	0.7%
K40552	345510	tissue	0.4%
K40553	345511	tissue	0.2%
K40554	345512	tissue	1.0%
K40555	345513	tissue	0.6%
K40556	345514	tissue	0.8%
K40557	345515	tissue	0.3%
K40568	345516	tissue	0.4%
K40569	345517	tissue	1.1%
K40570	345518	tissue	0.3%
K40571	345519	tissue	0.3%
K40572	345520	tissue	0.4%

CHAIN OF CUSTODY



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 448-9120

CHAIN OF CUSTODY RECORD

000004

PROJ. NO.		PROJECT NAME				Whole Fish		Number of Containers		PLB (Anchors)		B Lipids		REMARKS		
STA NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION											
K 40524-C1	10/14/97	14:00	X		New Richmond ABSA #11 Juvenile Sm Bass	1	X	X						Combine K40524-C2 with K40524-C1 (provided each)		
K 40530-C														Process all Juvenile bass composite samples as		
K 40531-C														whole-body composites and analyze following analytical		
K 40532-C														procedures discussed previously.		
K 40533-C	10/17/97	10:00	X		Lake Megan ABSA #9 Juvenile Sm Bass	1										
K 40534-C1	"	"	"		"	1								* Retain C-1 to combine with 40534-C2 which will allow		
K 40535	10/17/97	10:00	X		Lake Allegan ABSA #9 Adult Carp	1	X	X						Fillet carp (skin-off fillets) and bass (skin-on,		
K 40536														scales-on fillets) and analyze fillets following		
K 40537														analytical procedures discussed previously.		
K 40538																
K 40539																
K 40540					Lake Allegan ABSA #9 Adult Bass											
K 40541																
K 40542																
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)				
K 40542					10/17/97	16:30										
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)				
Relinquished by: (Signature)					DATE	TIME	Received for Laboratory by: (Signature)					Remarks				
							Sharon Meyer 10/18/97 10/15					COPY - ORIGINAL ON FILE				



6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066
TEL: (315) 446-9120

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME																					
61524711		Kalamazoo River Resident fish																					
SAMPLERS: (Signature)		[Signature]																					
STA. NO.	DATE	TIME	COMP.	SRAB	STATION LOCATION	Whole Fish	Number of Containers	X ABS (Amber)	X % B Lipids	REMARKS													
K40543	10/10/97	15:00		X	New Richmond ABSA #11 Adult Carp			X		Fillet and a carp (skin-off fillets) and less (skin-on, scales-on) and analyze fillets following analytical procedures discussed previously.													
K40544	10/14/97	15:00		X	New Richmond ABSA #11 Adult Carp			X															
K40545																							
K40546																							
K40547																							
K40548																							
K40549																							
K40550																							
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)					DATE	TIME	Relinquished by: (Signature)				
[Signature]					10/17/97	16:30																	
Relinquished by: (Signature)					DATE	TIME	Received by: (Signature)					Relinquished by: (Signature)					DATE	TIME	Relinquished by: (Signature)				
Relinquished by: (Signature)					DATE	TIME	Received for Laboratory by: (Signature)					DATE	TIME	Remarks:									

000005

DATA REVIEW FOR
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER
SUPERFUND SITE

SDG# FISH04

PCB ANALYSES

BIOTA

Analyses performed by:

ITS Environmental, Inc.
Colchester, Vermont

Review performed by:



Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the PCB data package for SDG# FISH04 for the analysis of tissue from the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and sample results for PCB and Lipid analyses. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sampling Date	Analyses				
				VOA	BNA	PCB	TAL	%LIPID
K40573	345521	tissue	10/21/97			x		x
K40574	345522	tissue	10/21/97			x		x
K40551-C	345523	tissue	10/20/97			x		x
K40564-C	345524	tissue	10/21/97			x		x
K40565-C	345525	tissue	10/21/97			x		x
K40566-C	345526	tissue	10/21/97			x		x
K40567-C	345527	tissue	10/21/97			x		x
K40558	345528	tissue	10/20/97			x		x
K40559	345529	tissue	10/20/97			x		x
K40560	345530	tissue	10/20/97			x		x
K40561	345531	tissue	10/20/97			x		x
K40562	345532	tissue	10/20/97			x		x
K40563	345533	tissue	10/20/97			x		x
K40575	345534	tissue	10/21/97			x		x
K40576	345535	tissue	10/21/97			x		x
K40577	345536	tissue	10/21/97			x		x
K40578	345537	tissue	10/21/97			x		x
K40579	345538	tissue	10/21/97			x		x
K40580	345539	tissue	10/21/97			x		x
K40582	345540	tissue	10/21/97			x		x

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by ITS Environmental, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which is less likely to be affected by interferences. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

Since the samples were held in frozen storage, no holding time from date of collection applies; however, a holding time of 40 days from extraction to analysis has been applied to all samples.

All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks. Field blanks are not applicable to biota sampling.

3. System Performance

The system performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The initial calibration was within this limit for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limit for all Aroclors.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery for one surrogate was below control limits in samples K40565-C, K40566-C and K40567-C. Since recoveries for the remaining surrogate were within control limits, no data has been qualified based on the deviations. All other surrogate recoveries were within control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

All Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

All matrix spike and matrix spike duplicate recoveries and relative percent differences between recoveries were within control limits. All matrix spike blank recoveries were also within control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
<u>Data Completeness and Deliverables</u>			
Is there a narrative or cover letter present?	<u>X</u>	<u> </u>	<u> </u>
Are the sample numbers included in the narrative?	<u>X</u>	<u> </u>	<u> </u>
Are the sample chain-of-custodies present?	<u>X</u>	<u> </u>	<u> </u>
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	<u> </u>	<u>X</u>	<u> </u>
<u>Holding Times</u>			
Have any holding times been exceeded?	<u> </u>	<u>X</u>	<u> </u>
<u>Surrogate Recovery</u>			
Are surrogate recovery forms present?	<u>X</u>	<u> </u>	<u> </u>
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>	<u> </u>	<u> </u>
Were recoveries of TCX or DCB outside of specified limits for any sample or blank?	<u>X</u>	<u> </u>	<u> </u>
If yes, were the samples reanalyzed?	<u> </u>	<u>X</u>	<u> </u>
<u>Matrix Spikes</u>			
Is there a matrix spike recovery form present?	<u>X</u>	<u> </u>	<u> </u>
Were matrix spikes analyzed at the required frequency?	<u>X</u>	<u> </u>	<u> </u>
How many spike recoveries were outside of QC limits?			
<u> 0 </u> out of <u> 4 </u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u> 0 </u> out of <u> 2 </u>			
<u>Blanks</u>			
Is a Method Blank Summary Form present?	<u>X</u>	<u> </u>	<u> </u>
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	<u>X</u>	<u> </u>	<u> </u>
Do any method/reagent/instrument blanks have positive results?	<u> </u>	<u>X</u>	<u> </u>
Do any field/rinse blanks have positive results?	<u> </u>	<u> </u>	<u>X</u>
Are there field/rinse/equipment blanks associated with every sample?	<u> </u>	<u> </u>	<u>X</u>

PCB Data Review Checklist - Page 2

	YES	NO	NA
<u>Calibration and GC Performance</u>			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1221	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1232	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1242	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1248	<u>X</u>	<u> </u>	<u> </u>
Aroclor 1254	<u>X</u>	<u> </u>	<u> </u>
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	<u>X</u>	<u> </u>	<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u>X</u>	<u> </u>	<u> </u>
Have all samples been injected within a 12 hour period beginning with the injection of a calibration standard?	<u>X</u>	<u> </u>	<u> </u>
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	<u>X</u>	<u> </u>	<u> </u>
Are %D values for all compounds within limits (less than 15%)?	<u>X</u>	<u> </u>	<u> </u>
<u>Analytical Sequence Check</u>			
Is a analytical sequence form present and complete for each column and each period of analyses?	<u>X</u>	<u> </u>	<u> </u>
Was the proper analytical sequence followed?	<u>X</u>	<u> </u>	<u> </u>
<u>Cleanup Efficiency Verification</u>			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u> </u>	<u> </u>	<u>X</u>
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	<u>X</u>	<u> </u>	<u> </u>
<u>PCB Identification</u>			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>X</u>	<u> </u>	<u> </u>
Do the combined column and individual column Aroclor identifications agree?	<u>X</u>	<u> </u>	<u> </u>
Were there any false negatives?	<u> </u>	<u>X</u>	<u> </u>

PCB Data Review Checklist - Page 3

	YES	NO	NA
Was GC/MS confirmation provided when required?	<u> </u>	<u> </u>	<u> X </u>
<u>Compound Quantitation and Reported Detection Limits</u>			
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> X </u>	<u> </u>	<u> </u>
<u>Chromatogram Quality</u>			
Were the baselines stable?	<u> X </u>	<u> </u>	<u> </u>
Were any electronegative displacement (negative peaks) or unusual peaks detected?	<u> </u>	<u> X </u>	<u> </u>
<u>Field Duplicates</u>			
Were field duplicates submitted with the samples?	<u> </u>	<u> </u>	<u> X </u>

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	
		TCX	DCB
K40573			
K40574			
K40551-C			
K40564-C			
K40565-C			
K40566-C			
K40567-C			
K40558			
K40559			
K40560			
K40561			
K40562			
K40563			
K40575			
K40576			
K40577			
K40578			
K40579			
K40580			
K40582			

Surrogate Standards
 TCX Tetrachloro-m-xylene
 DCB Decachlorobiphenyl

Qualifiers:
 D Surrogates diluted out
 : Recovery high
 ! Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP3327
Column: RTX-35 / RTX-5

[illegible]

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40574

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345522

Phase Weight: 10.3 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 200 ~~100~~ 4619%

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	130	
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	53	

REVIS
APR 08 1998

By KRC

000018

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40551-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345523

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 2.0

Date Analyzed: 03/05/98

% Solids: ~~100~~ *100* *118/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	100	U
12672-29-6	Aroclor-1248	100	U
11097-69-1	Aroclor-1254	220	
11096-82-5	Aroclor-1260	100	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40564-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345524

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 5.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	250	U
11104-28-2	Aroclor-1221	250	U
11141-16-5	Aroclor-1232	250	U
53469-21-9	Aroclor-1242	250	U
12672-29-6	Aroclor-1248	950	
11097-69-1	Aroclor-1254	640	
11096-82-5	Aroclor-1260	220	J

REVIS
APR 08 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40565-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345525

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 10.0

Date Analyzed: 03/05/98

% Solids: 100 KKC 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	500	U
12672-29-6	Aroclor-1248	700	
11097-69-1	Aroclor-1254	440	J
11096-82-5	Aroclor-1260	500	U

REVISE
APR 08 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40566-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345526

Phase Weight: 10.1 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 3.0

Date Analyzed: 03/05/98

% Solids: 100 *klc* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	670	
11097-69-1	Aroclor-1254	660	
11096-82-5	Aroclor-1260	170	

REVISED
APR 08 1998

By *klc*

000054

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40567-C

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345527

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 2.0

Date Analyzed: 03/05/98

% Solids: 100% *4/15/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	100	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	100	U
53469-21-9	Aroclor-1242	100	U
12672-29-6	Aroclor-1248	320	
11097-69-1	Aroclor-1254	190	
11096-82-5	Aroclor-1260	100	U

REVISED
APR 08 1998

By *KFC*

000063

FORM 1
AROCLOL ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40558

Lab Name: ITS Environmental

Lab Code: WCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345528

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/26/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 ~~KL~~ 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	72	
11096-82-5	Aroclor-1260	50	U

REVISE
APR 08 1998

By KPC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40559

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345529

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	28	J
11096-82-5	Aroclor-1260	50	U

REVISIT
APR 08 1998

By

000081

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40560

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345530

Phase Weight: 10.2 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 *KE* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	49	U
11097-69-1	Aroclor-1254	78	
11096-82-5	Aroclor-1260	49	U

REVISIT
APR 08 1998

by

KE

000090

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40561

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345531

Phase Weight: 10.2 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 300 *YR* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	49	U
11104-28-2	Aroclor-1221	49	U
11141-16-5	Aroclor-1232	49	U
53469-21-9	Aroclor-1242	49	U
12672-29-6	Aroclor-1248	49	U
11097-69-1	Aroclor-1254	100	
11096-82-5	Aroclor-1260	72	

REVIS
APR 08 1998

By *KRC*

000099

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40562

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345532

Phase Weight: 10.1 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% *KR 4/8/98*

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	44	J
11096-82-5	Aroclor-1260	50	U

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40563

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345533

Phase Weight: 10.1 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 *KL* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	83	
11096-82-5	Aroclor-1260	50	U

REVISE
APR 08 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40575

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345534

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 3.0

Date Analyzed: 03/05/98

% Solids: 100% KPL 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	150	U

REVISE
APR 08 1998

By KPL

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40576

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345535

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	180	
11097-69-1	Aroclor-1254	140	
11096-82-5	Aroclor-1260	34	J

REVISED
APR 08 1998

By KPC

000134

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40577

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345536

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 *KPC* 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	140	
11097-69-1	Aroclor-1254	150	
11096-82-5	Aroclor-1260	31	J

REVISE
APR 08 1998

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40578

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345537

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 KPC 418198

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	130	
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	250	
11096-82-5	Aroclor-1260	50	U

REVIS
APR 08 1998

By KPC

ITS Environmental 55 South Park Drive Colchester, Vermont 05446

Telephone (802) 655-1203

Fax (802) 655-1248

000152

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40579

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345538

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 KRC 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	98	
11097-69-1	Aroclor-1254	170	
11096-82-5	Aroclor-1260	33	J

REVISE
APR 08 1998

By KRC

00010

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40580

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345539

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100 KPC 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	J
12672-29-6	Aroclor-1248	50	U
11097-69-1	Aroclor-1254	110	
11096-82-5	Aroclor-1260	50	U

REVISE
APR 08 1998

By KPC

000170

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40581

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345540

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 1.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	50	U
11104-28-2	Aroclor-1221	50	U
11141-16-5	Aroclor-1232	50	U
53469-21-9	Aroclor-1242	50	U
12672-29-6	Aroclor-1248	150	
11097-69-1	Aroclor-1254	160	
11096-82-5	Aroclor-1260	50	U

REVISE
APR 08 1998

By KFC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40581MS

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345540MS

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 10.0

Date Analyzed: 03/05/98

% Solids: 100 KRC 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	6100	
12672-29-6	Aroclor-1248	500	U
11097-69-1	Aroclor-1254	6200	
11096-82-5	Aroclor-1260	500	U

REVIS
APR 08 1998

By KRC

FORM 1
AROCOR ANALYSIS DATA SHEET

EPA SAMPLE NO.

K40581MSD

Lab Name: ITS Environmental

Lab Code: INCHVT

Contract: 91082

Case: PCB

SDG: FISH04

Phase Type: BIOTA

Lab Sample ID: 345540MD

Phase Weight: 10.0 (g)

Date Received: 10/23/97

Injection Volume: 1.0 (uL)

Date Extracted: 02/23/98

Dilution Factor: 10.0

Date Analyzed: 03/05/98

% Solids: 100% 4/8/98

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (ug/Kg)	QUALIFIER
12674-11-2	Aroclor-1016	500	U
11104-28-2	Aroclor-1221	500	U
11141-16-5	Aroclor-1232	500	U
53469-21-9	Aroclor-1242	5400	
12672-29-6	Aroclor-1248	500	U
11097-69-1	Aroclor-1254	5500	
11096-82-5	Aroclor-1260	500	U

REVISE
APR 08 1998

By Kee

PERCENT LIPID ANALYSES

Percent Lipids Results

Sample ID	Lab ID	Matrix	Result
K40574	345522	tissue	0.3%
K40551-C	345523	tissue	1.5%
K40564-C	345524	tissue	2.4%
K40565-C	345525	tissue	2.9%
K40566-C	345526	tissue	2.2%
K40567-C	345527	tissue	3.2%
K40558	345528	tissue	0.6%
K40559	345529	tissue	0.2%
K40560	345530	tissue	0.4%
K40561	345531	tissue	0.3%
K40562	345532	tissue	0.4%
K40563	345533	tissue	0.3%
K40575	345534	tissue	0.5%
K40576	345535	tissue	0.6%
K40577	345536	tissue	0.4%
K40578	345537	tissue	0.7%
K40579	345538	tissue	0.3%
K40580	345539	tissue	0.4%
K40582	345540	tissue	0.4%